NAVAL FIGHTERS NUMBER SEVENTY - FOUR

e Martin
P5M
Patrol Seaplane

SF
1256
NAVY
VP-48
7

BY CAPT RICHARD HOFFMAN USN (RET)

DEDICATION

To all the brave and dedicated men who flew and supported the Marlin, and especially to:

The fearless Sonar Seaplane crew;
LT George W. East
ADC Leonard J. Riccio
ATN1 Dean Buchannan
SOC Norman M. Nicholson
SO1 Harold W. Christofferson
AO1 Class William C. Churchwell
and our non-rated shipmates

ABOUT THE AUTHOR

Capt. Richard A. Hoffman, USN (RET), graduated from the U.S. Naval Academy in 1947, after which he served two years on the destroyer *USS Dennis J. Buckley* (DDR-808). After flight training he served with Air Transport Squadron Two (VR-2), flying the Martin JRM Mars transport flying boat (see Naval Fighters #29). He then flew the Martin PBM Mariner patrol bomber with Patrol Squadron 892 (VP-892 later designated VP-50 during the Korean War). In 1954, he attended the Naval Postgraduate School where he was awarded a Bachelor's Degree in Aeronautical Engineering and then earned a Masters Degree in Seaplane Hydrodynamics from the Stevens Institute of Technology.

In 1957, Hoffman joined Air Development Squadron One (VX-1) where he was the Project Officer for Seaplane Sonar trials in the Martin P5M-2 Marlin.He then served as Operations Analysis Officer on the staff of Commander Anti-Submarine Warfare Force, Atlantic Fleet (COMASWFORLANT). He then entered the U.S. Naval Test Pilot School (USNTPS) in 1961. After graduation he served at the Naval Air Test Center (NATC) for trials of the Lockheed P3V Orion. He also participated in tests of the Atlantique patrol plane in France. In 1962, he established a World Speed Record for amphibious aircraft (which still stands) in the Grumman Albatross.

Capt. Hoffman commanded Patrol Squadron Eight (VP-8), a P-3 squadron, during the Viet Nam War, and later was Executive Officer of the USS Austin (LPD-4). After duty as Director, Advanced Systems Concepts Division of the Naval Air Systems Command, he participated in flight tests of the Japanese Shin Meiwa PS-1 flying boat. He attended the U.S. Air Force Air War College and in 1971 became Commander of the Pacific Undersea Surveillance System (COMOCEANSYSPAC). Capt. Hoffman retired from the Navy in 1974. He went to work for Martin Marietta Aerospace, Lockheed Aircraft and McDonnell Douglas Astronautics until complete retirement in 1992.

Hoffman has published articles on seaplanes and flying boats in magazines and historical journals. His book, *The Fighting Flying Boat*, a history of the Martin PBM Mariner, was published by the U.S. Naval Institute in 2004.

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FRONT COVER

VP-48 SP-5B BuNo 141256 in flight over San Diego area with NAS North Island in the background. (USN via Tailhook)

BACK COVER

Left side top-to-bottom: VP-48 P5M-1 BuNo 126499 with a VP-47 P5M-2 in the background. (USN) VP-50 SP-5B BuNo 135532 starts take off run on San Diego bay on 1965. (William Swisher) The end of the last Marlin flight as VP-40 SP-5B BuNo 135533 prepares to land at NAS Patuxent River, MD, on 2 December 1968. (USN) VP-50 SP-5B BuNo 135496 on the seaplane ramp at NAS North Island, CA, on 12 June 1965. (William Swisher) VT-31 P5M-1T BuNo 149825 retained its Coast Guard colors until its retirement. (via Robert F. Dorr) VP-31 SP-5B BuNo 147931 at North Island on 25 August 1962. (William Swisher) Right side top-to-bottom: VP-46 P5M-1 BuNo 130296 at North Island on 18 March 1960. (William Swisher) VP-48 SP-5B BuNo 135532 at White's Cove, Catalina Island, on 31 July 1963. (William Swisher) VP-48 SP-5B BuNo 135542 at North Island on 12 June 1965. (William Swisher) USCG P5M-1G 1284 in original CG colors. (Robert F. Dorr) USCG P5M-1G 1287 was assigned to CGAS San Diego on 29 August 1959. (William Swisher) French P5M-2 takes off in 1958. (Martin)

MARTIN P5M MARLIN BY CAPTAIN RICHARD A. HOFFMAN USN (RET)

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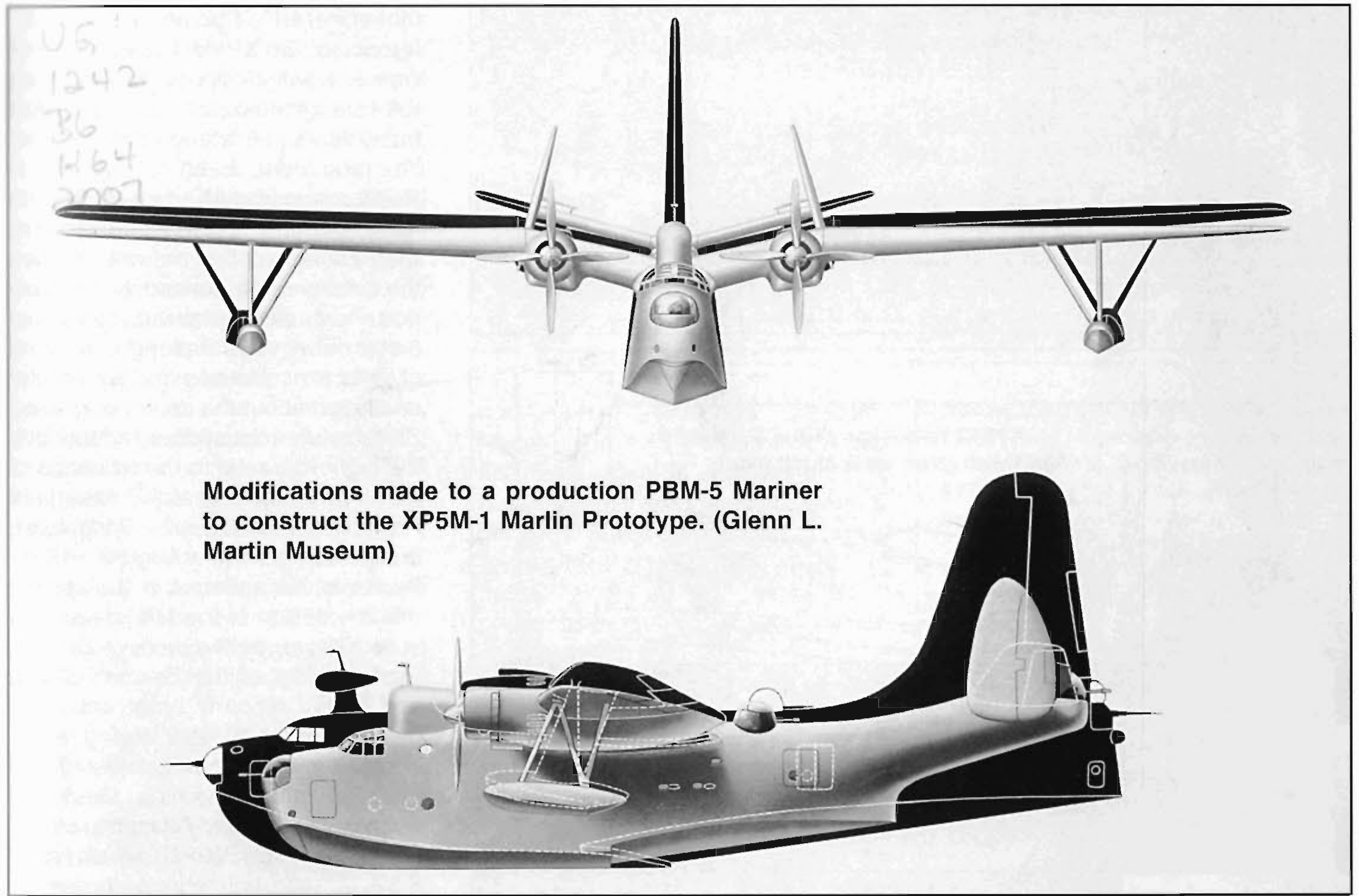


Modifications made to a production PBM-5 Mariner to construct the XP5M-1 Marlin Prototype. (Glenn L. Martin Museum)

MARLIN DESIGN, DEVELOPMENT AND PRODUCTION

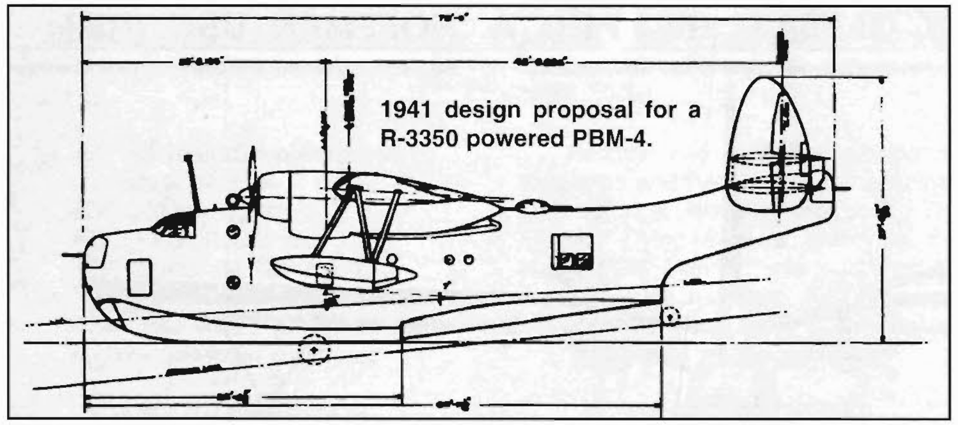
The lineage of the Marlin can be traced back to the PBM-4 Mariner design proposal of 1941.

The PBM-1/2, ordered in 1937, was fitted with Wright Aeronautical Company (WAC) 1,600 HP R-2600-6 engines. Follow-on PBM-3, -3C, -3R and -3S models were equipped with WAC 1,700 HP R-2600-12 engines. The final version of the series, the PBM –3D, had WAC 1,900 HP R-2600-22 engines. Even with the 1,900 HP engines, the PBM-3 series Mariner was seriously under-powered, with poor take-off, climb and single-engine performance.

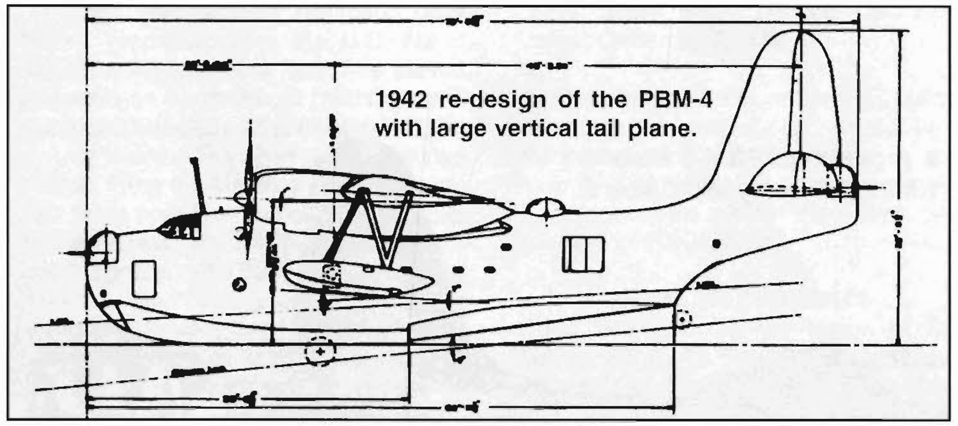
To improve the Mariner's performance, in 1941 Martin proposed a PBM-4 design, to be fitted with the WAC 2200 HP R-3350 engine. Although the basic concept was accepted by the Navy, the Bureau of Aeronautics expressed concern that the existing PBM twin stabilizer/rudder was not an appropriate match for the more powerful engines and directed examination of a new stabilizer/rudder design before actual production was to begin. Engineering analysis verified the Bureau's concern and the final PBM-4 design had a large single fin and rudder. 180 PBM-4s were ordered, although Bureau Numbers for 220 were allocated. However, the PBM-4 order was canceled and the final model of the PBM, the PBM-5, was fitted with Pratt and Whitney (P&W) 2,100 HP R-2800-22 engines and retained the original Mariner empennage.

Martin Company engineers continued to explore design concepts for an R-3350-powered flying boat and in 1945 came up with a "PBM-6" (a Martin Company, not a U.S. Navy designation) design.

On 22 May 1946 Martin received a contract (NOas 4017) to construct an aerodynamic/hydrodynamic prototype of a new flying boat patrol bomber to be based on the PBM-6 design studies. To do this economically and expeditiously, the last production PBM-5 flying boat, BuNo 98616, was to be rebuilt into a demonstration prototype which was designated XP5M-1. While retaining the wings, wing floats and hull crown of the PBM, the XP5M-1 was fitted with the WAC R-3350-26W engines rated at 2700 HP with reversing propellers. The value of the reversing propellers had been demonstrated on the Coast Guard PBM-5G flying boat and the PBM-5A amphibian. These propellers permitted rough water operation by shortening the landing run-out and greatly improved maneuverability on the water. The XP5M-1 was also equipped with a single-fin tail that appears to have been borrowed from the 1944 Martin P4M-1 Mercator landplane. In fact, the U.S. Navy "Standard Aircraft Character-

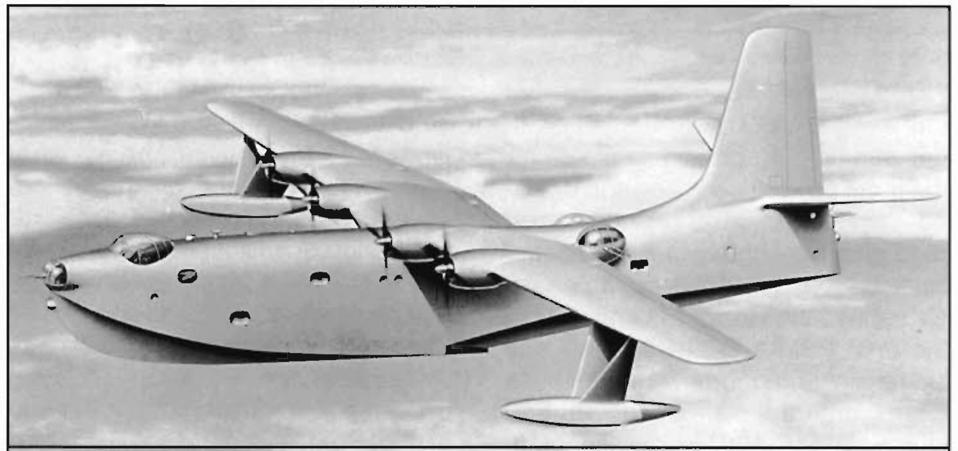


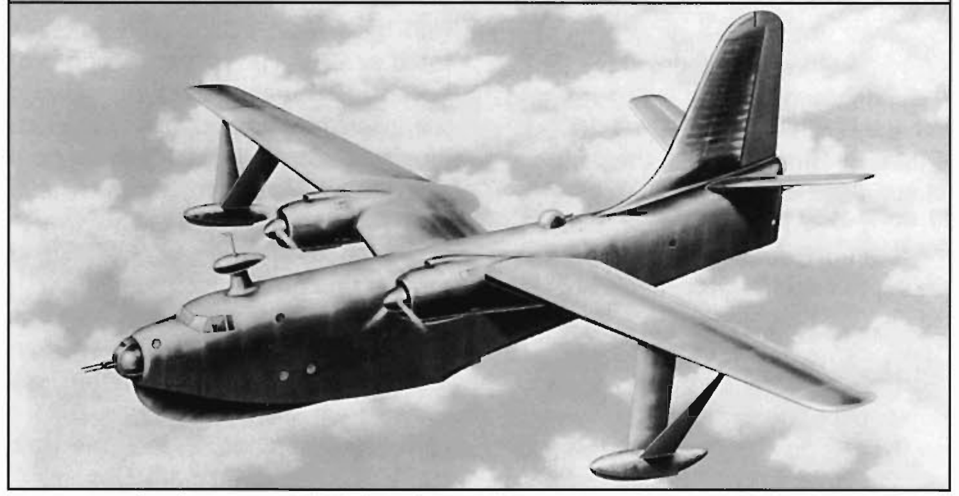
1941 design proposal for a R-3350 powered PBM-4.



1942 re-design of the PBM-4 with large vertical tail plane.

Below, 1945 proposal for the four-engine Martin Model 230. Note tail design which would be used on the P5M-1. (Martin) Bottom, two-engine XP5M-1 design proposal. (Martin)





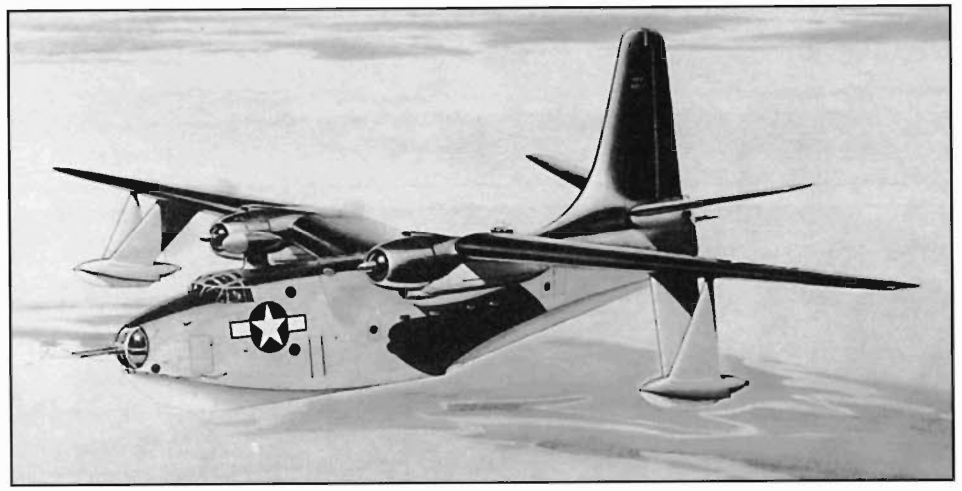
istics" for the P5M-1 states: "Stabilizer is interchangeable with that of P4M-1". The most obvious difference of the XP5M-1 from the PBM was a newly-designed hull with an 8.6:1 length-to-beam (l/b) ratio. For many years, the "standard" flying boat l/b ratio had been about 6.5:1. Research indicated a higher l/b ratio would not only improve aerodynamic drag characteristics but also reduce the undesirable tendency to "porpoise"—a self-sustaining oscillatory motion in a vertical plane consisting of vertical oscillations and an angular oscillation about the center of gravity. Some references attribute adoption of the higher l/b ratio to the influence of the very successful Japanese Kawanishi H8K-2 Emily flying boat, first ordered in August 1938. However, the author is of the opinion that the design of the Marlin hull was in fact driven by the work of Dr. Ing. Richard Vogt of the German Blohm and Voss Company. Vogt was chief designer of the BV-222 Wiking, a six-engined flying boat, originally ordered in 1936 by the airline Deutsche Lufthansa for trans-Atlantic passenger service. The BV-222, which had a 8.5:1 l/b ratio hull, was a successful design and 12 more were produced for the German armed forces. Seven Wikings were used to transport supplies to the Afrika Corps. Others were used in the Baltic for medical evacuation missions. Three survived the war and underwent extensive testing by the Royal Air Force and the U.S. Navy. Vogt also designed the BV-238, a scaled-up BV-222 with a 10:1 l/b ratio hull.

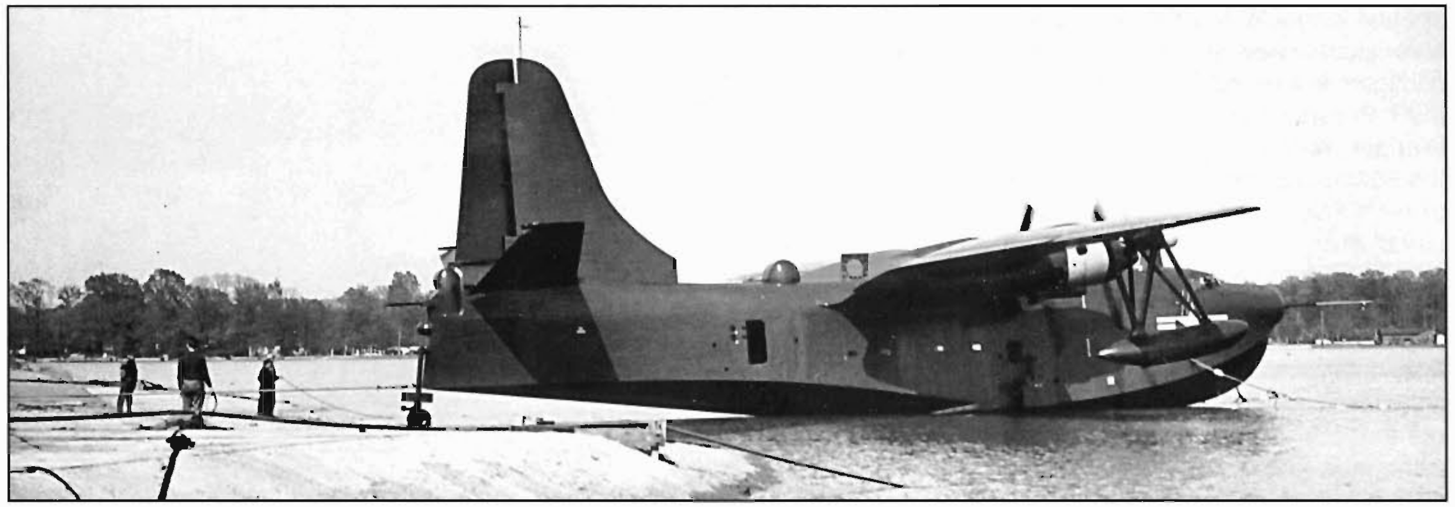
Because of the World War 2 experience of Mariner battles with surfaced U-boats and against Japanese ships and fighter planes, the XP5M-1 was initially envisioned as heavily armed. The prototype had mock-ups of twin 20mm cannons in powered bow and tail turrets and of two 50 caliber machine guns in a dorsal turret.

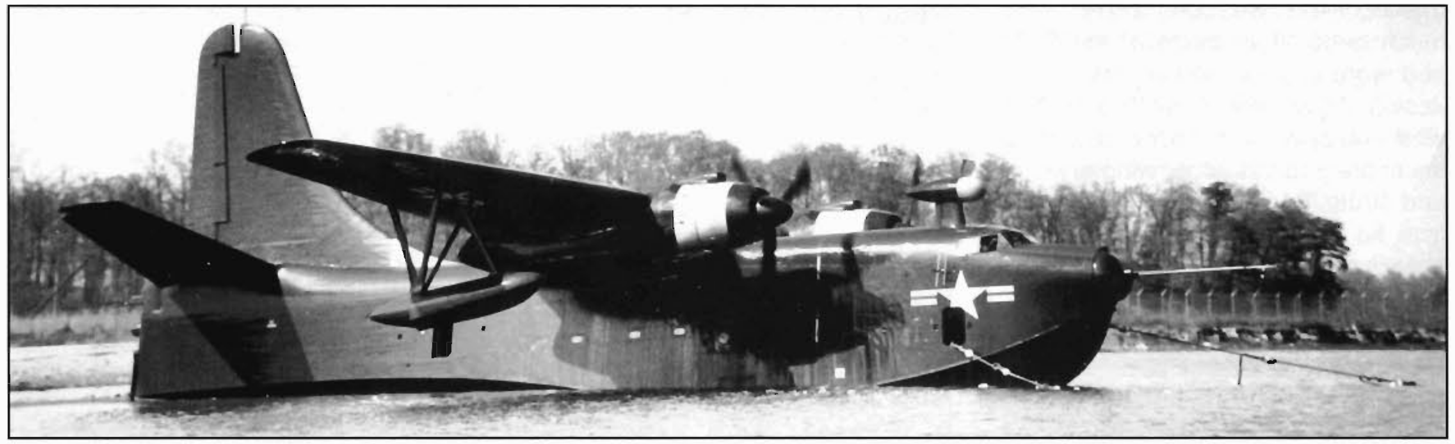
The XP5M-1 first flew in May 1948. Testing was satisfactory and the contract was amended on 1 October 1949 to develop a production P5M-1. The production P5M-1 was not just a copy of the XP5M-1. It was a completely new aircraft whose final configuration would be determined by the mission of Anti-Submarine Warfare (ASW). Although the wing of the P5M-1 had the same span as that of the XP5M-1, it had more dihedral, used different airfoil sections, had a different Mean Aerodynamic Chord (MAC), and was stressed for a much higher aircraft gross weight. The P5M-1 wing used a single-slotted flap and incorporated upper-surface spoilers for improved roll performance. Although it retained the PBM's nacelle weapons bay configuration, the P5M-1's weapons bays were much larger than those of the PBM and were capable of carrying all the known ASW weapons. The P5M-1 was equipped with newly designed, lower drag and stronger wingtip floats and struts. Because the P5M-1's vertical fin was too high to fit in most Navy hangars, the fin was hinged and could be folded.

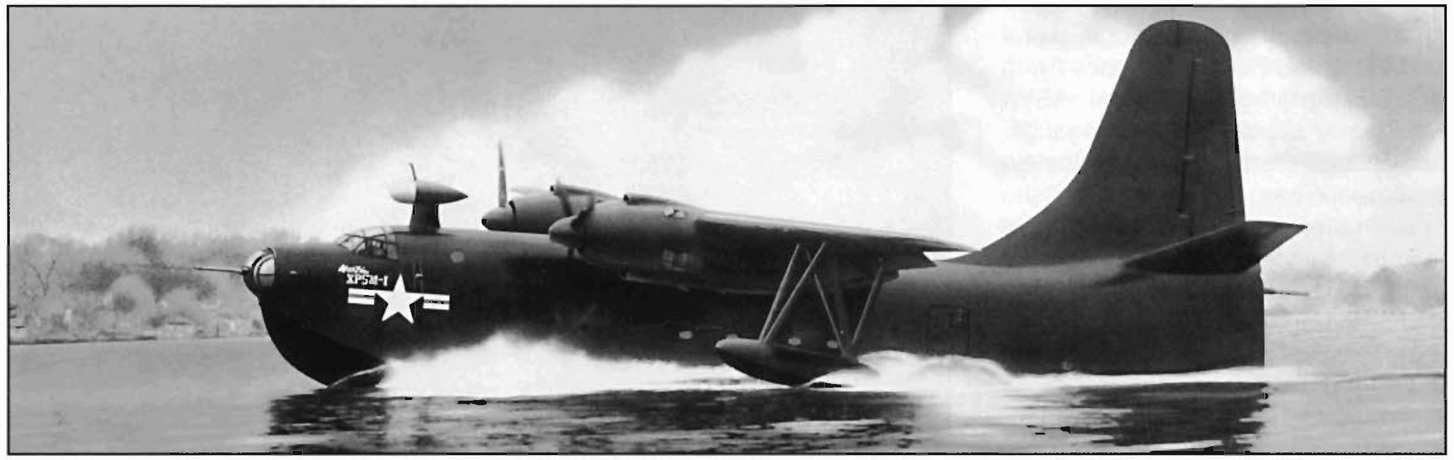
The mission of the P5M-1 as stated in the U.S. Navy "Standard Aircraft Characteristics (NAVAER 1335A)" of 1 September 1950 was: "The P5M-1 is an all-weather long-range patrol and Electronic Reconnaissance flying boat designed primarily for ASW. Secondary missions are long-range, low altitude radar mapping; minelaying; open sea rescue. "When the specifications for the P5M-1 were issued, the most likely potential adversary was a Soviet diesel submarine which used captured German Type XXI technology. These submarines did not routinely operate on the surface. They were snorkel-equipped and the only airborne electronic sensor capable of detecting a snort or periscope was radar, and a snorkel or a periscope was a very difficult radar target. The Patrol Plane (VP) community's concept of operations in those days was one in which Signals Intelligence (SIGINT) cueing was used to vector radar-equipped aircraft to the area of surfaced or snorkeling submarines, where they would be attacked by acoustic homing torpedoes derived from the World War II Mk. 24. To improve detection of the threat submarine, the Navy had the Philco Corporation develop the AN/APS-44 "Periscope Detecting Radar". The APS-44 was the largest and most powerful airborne radar to date. It transmitted on both X and C band and had a peak power output of 1 megawatt (1,000,000 watts). To detect a target as small as a periscope required a very narrow

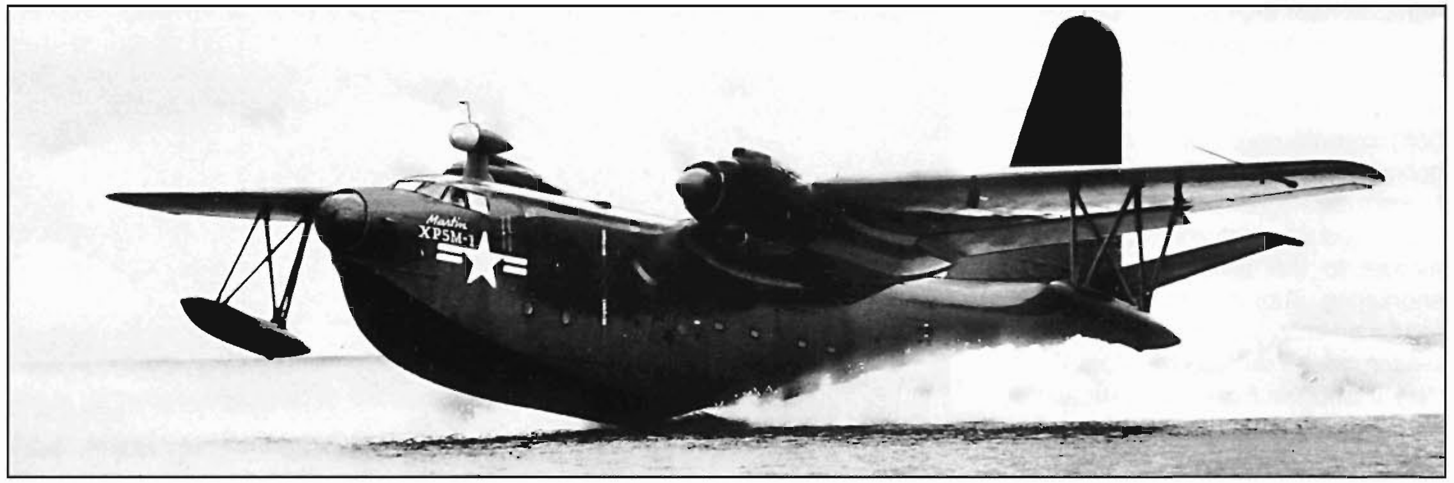
Above, German Blohm and Voss BV-222 Wiking, a pioneer in high l/b ratio hulls. (National Archives) Below, heavily armed XP5M-1 illustration. (Martin) Bottom, the XP5M-1 runs its engines on the Martin ramp in preparation of its first flight in May 1948. The aircraft was originally built as PBM-5 BuNo 98616. (Martin)

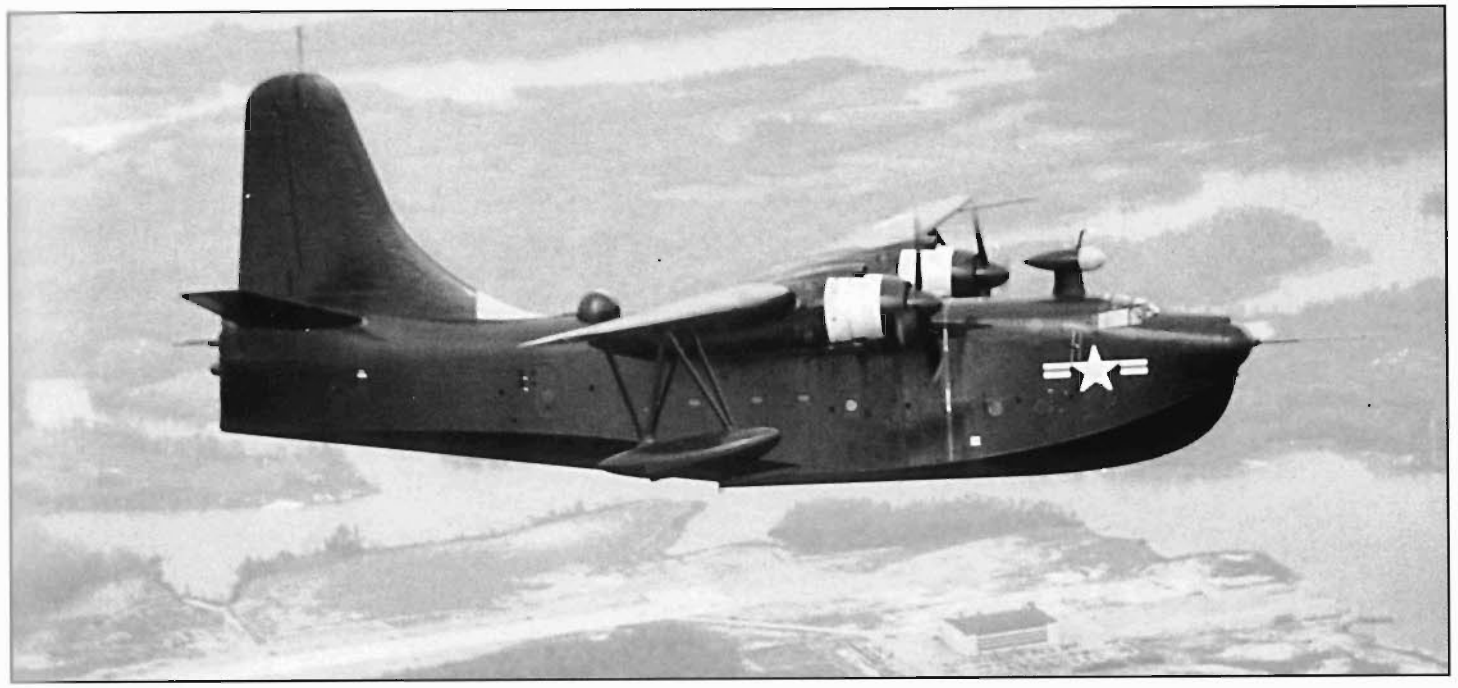








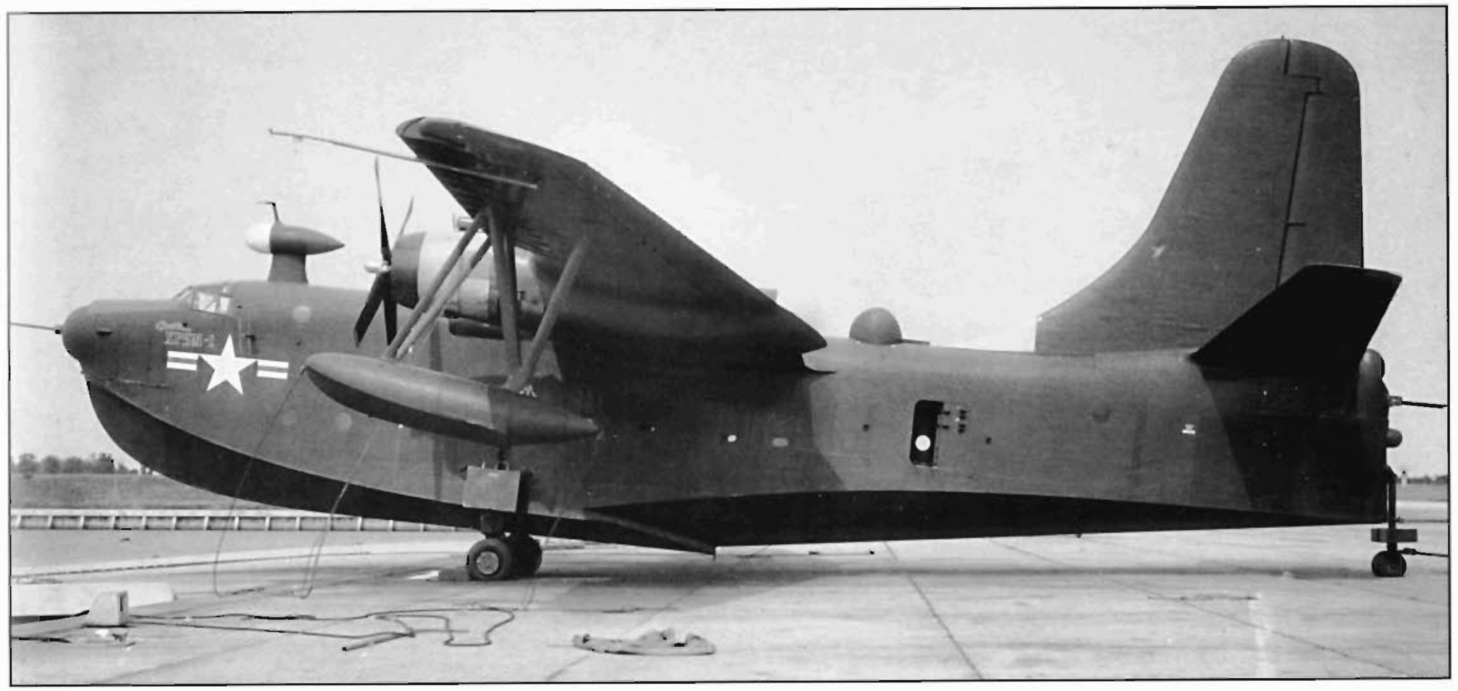




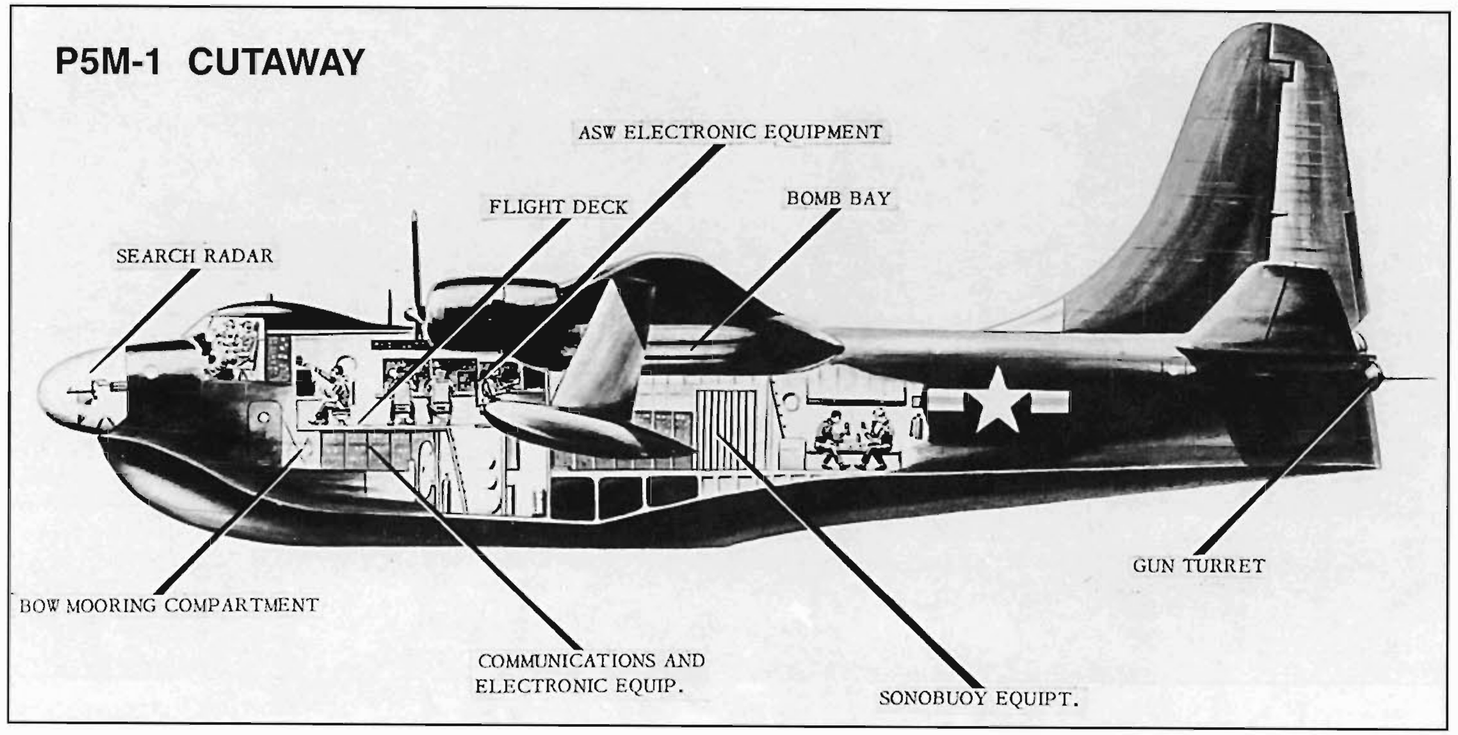
Photos at left, first flight of the XP5M-1 on 17 May 1948. Top-to-bottom, aircraft entering waters at New River with beaching gear attached. Engine run-up prior to takeoff. Two retouched photos of taxi and takeoff run (natural metal engine cowls have been retouched to match the rest of the plane). (Martin) Above, XP5M-1 over the Chesapeake on its initial flight. The XP5M-1 was modified from a PBM-5 and evaluated the long afterbody hull that permited safer landings in rough seas without excessive pitching and bouncing and reduced normal takeoff time and distance. (Martin) Below, XP5M-1 at NATC on 14 June 1949. (USN)

radar beam, and a narrow beam required a large antenna. The APS-44 antenna had a diameter of 7-1/2 feet. The only reasonable location for this size antenna in a flying boat was in the nose. Consequently the P5M-1's nose was a large bulbous radome. The radome was so large that the cockpit had to be raised above that of the XP5M-1 and the P5M-1 cockpit configuration resembled that of the P4M-1 Mercator.

The electrical power required by the APS-44 radar drove the design of the Marlin's electrical system. Heretofore, most aircraft electrical systems were 24 volt Direct Current (DC). To provide the electrical power needed by the Marlin, a 400 cycle 115/200 Volt three-phase Alternating Current (AC) system was specified. Such a system required the power generator or alternator to run at a constant fixed speed. This required a Constant Speed Drive (CSD) system to convert the varying RPM of the Marlin's reciprocating engines to a constant and fixed RPM output to drive the alternators. In 1946, the



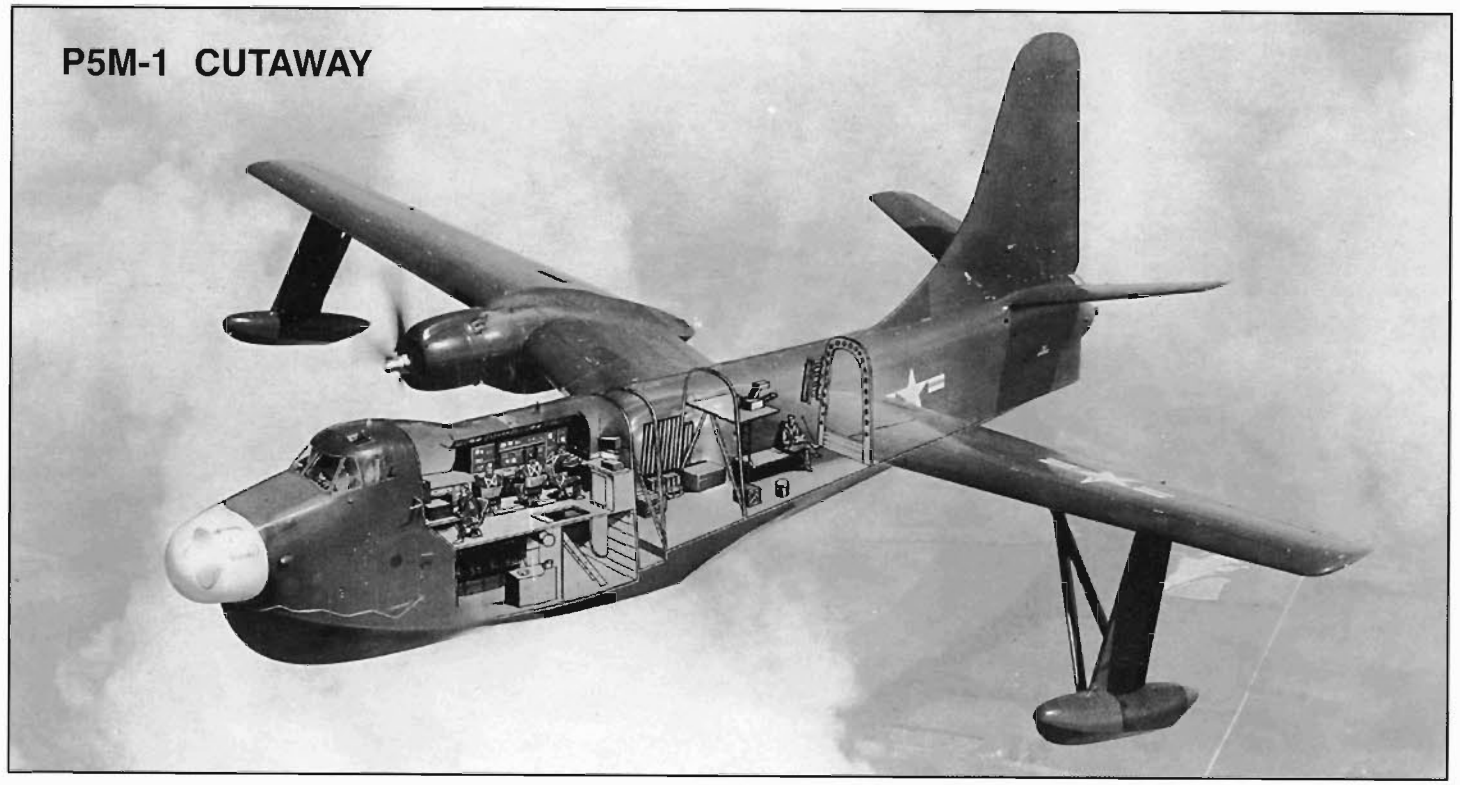
P5M-1 CUTAWAY


ASW ELECTRONIC EQUIPMENT
FLIGHT DECK
BOMB BAY
SEARCH RADAR
BOW MOORING COMPARTMENT
GUN TURRET
COMMUNICATIONS AND ELECTRONIC EQUIP.
SONOBUOY EQUIPT.

Sundstrand Machine Tool Company had developed a variable displacement hydraulic drive for this purpose. The Sundstrand drive had been installed in the B-36 Peacekeeper and was specified for the Marlin.

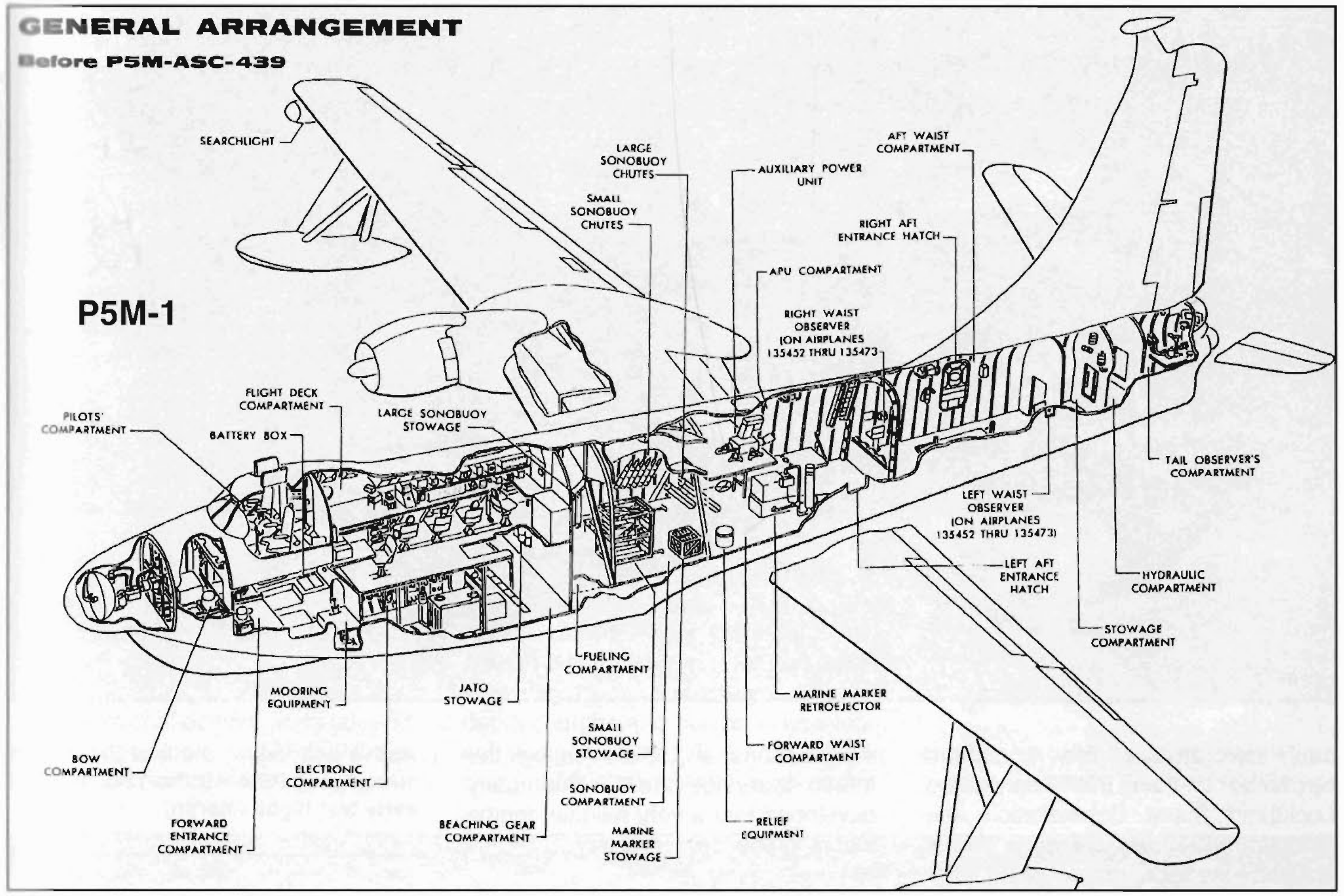
The engine selected for the production Marlin was the WAC R-3350-30 turbo-compound engine rated at 3,250 HP for takeoff. Development of this turbo-compound version of the R-3350 had been sponsored by the Navy specifically to improve the range and endurance of patrol planes. In this engine, exhaust gases from the cylinders were ducted into three "power recovery turbines (PRTs)" which were connected to the crankshaft via a fluid coupling. Each of the three PRTs delivered about 200 HP to the crankshaft. The turbo-compound engine also had a Specific Fuel Consumption (SFC) about 20% better than a non-compounded engine. Although it weighed about 540 lbs more than a non-compounded engine, the increased horsepower and improved SFC made this engine the the most powereful aircraft piston engine ever made. According to Vicenzi, 12,000 R-3350 turbo-compounds were built and they powered

P5M-1 CUTAWAY



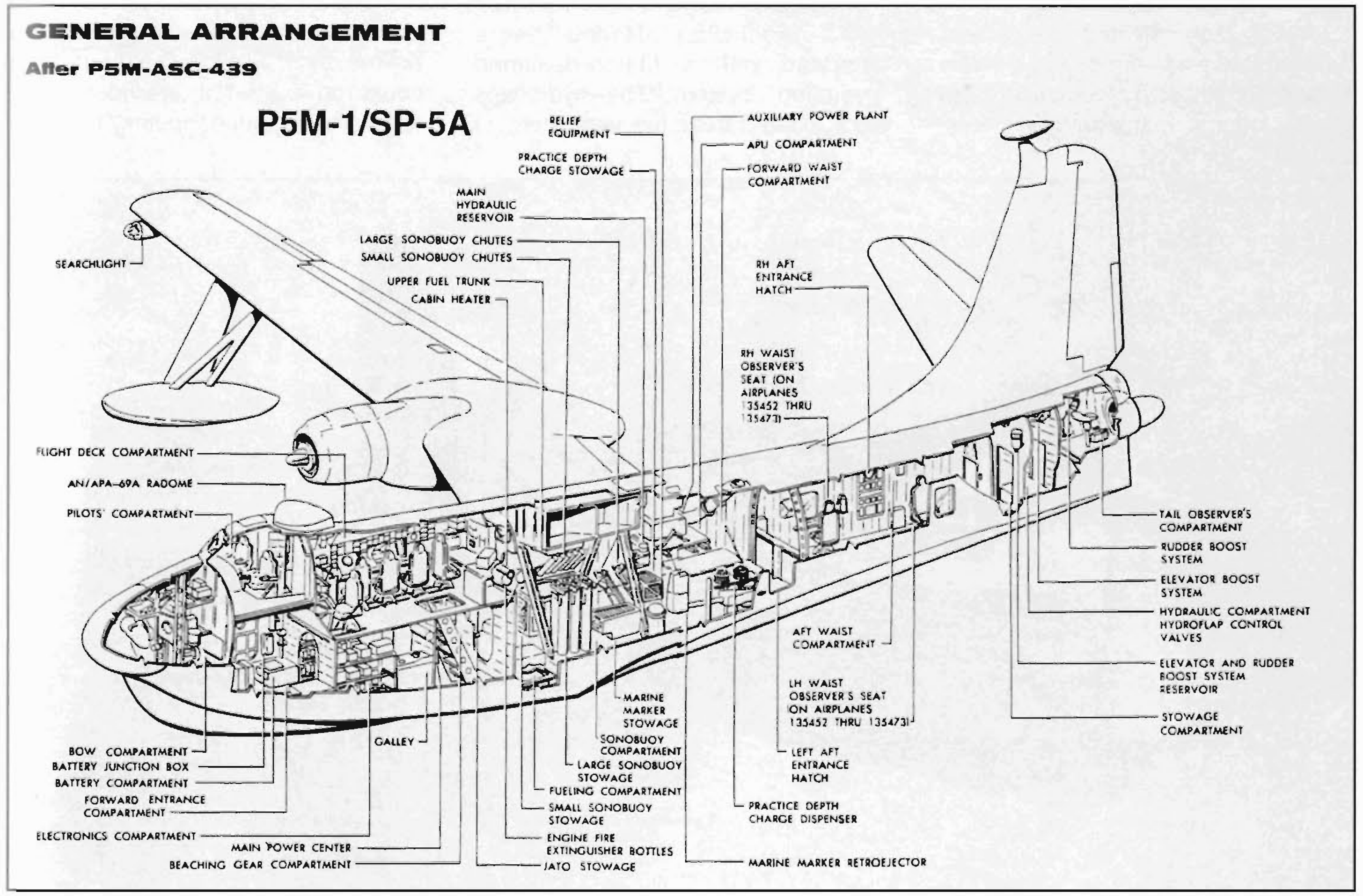
GENERAL ARRANGEMENT

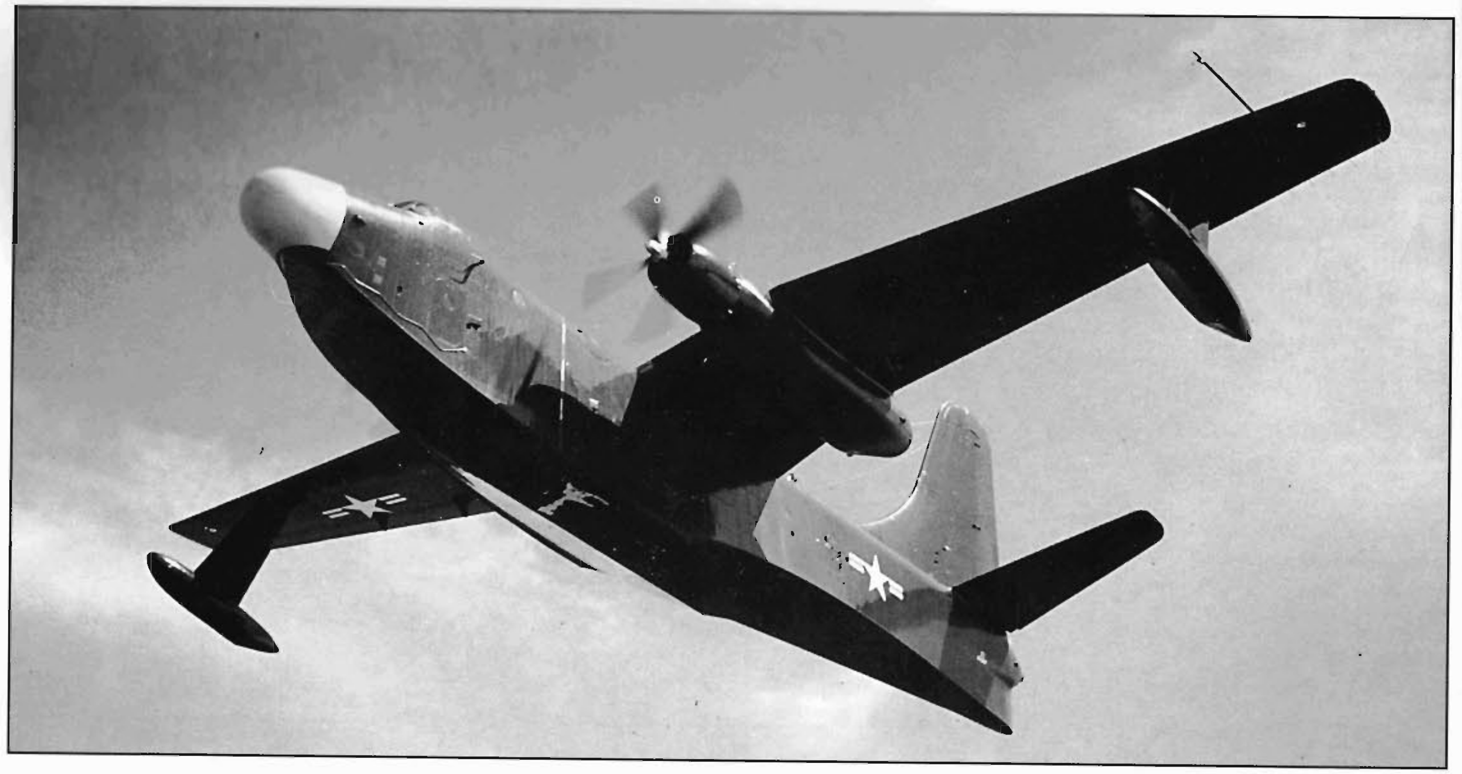
Before P5M-ASC-439


P5M-1
SEARCHLIGHT
LARGE SONOBUOY CHUTES
SMALL SONOBUOY CHUTES
AUXILIARY POWER UNIT
AFT WAIST COMPARTMENT
RIGHT AFT ENTRANCE HATCH
APU COMPARTMENT
RIGHT WAIST OBSERVER (ON AIRPLANES 135452 THRU 135473)
FLIGHT DECK COMPARTMENT
PILOTS' COMPARTMENT
BATTERY BOX
LARGE SONOBUOY STOWAGE
TAIL OBSERVER'S COMPARTMENT
LEFT WAIST OBSERVER (ON AIRPLANES 135452 THRU 135473)
LEFT AFT ENTRANCE HATCH
HYDRAULIC COMPARTMENT
STOWAGE COMPARTMENT
FUELING COMPARTMENT
MOORING EQUIPMENT
JATO STOWAGE
MARINE MARKER RETROEJECTOR
SMALL SONOBUOY STOWAGE
FORWARD WAIST COMPARTMENT
BOW COMPARTMENT
ELECTRONIC COMPARTMENT
SONOBUOY COMPARTMENT
FORWARD ENTRANCE COMPARTMENT
BEACHING GEAR COMPARTMENT
MARINE MARKER STOWAGE
RELIEF EQUIPMENT

GENERAL ARRANGEMENT

After P5M-ASC-439


P5M-1/SP-5A
RELIEF EQUIPMENT
AUXILIARY POWER PLANT
APU COMPARTMENT
PRACTICE DEPTH CHARGE STOWAGE
FORWARD WAIST COMPARTMENT
MAIN HYDRAULIC RESERVOIR
LARGE SONOBUOY CHUTES
SMALL SONOBUOY CHUTES
SEARCHLIGHT
UPPER FUEL TRUNK
CABIN HEATER
RH AFT ENTRANCE HATCH
RH WAIST OBSERVER'S SEAT (ON AIRPLANES 135452 THRU 135473)
FLIGHT DECK COMPARTMENT
AN/APA-69A RADOME
PILOTS' COMPARTMENT
TAIL OBSERVER'S COMPARTMENT
RUDDER BOOST SYSTEM
ELEVATOR BOOST SYSTEM
HYDRAULIC COMPARTMENT HYDROFLAP CONTROL VALVES
AFT WAIST COMPARTMENT
ELEVATOR AND RUDDER BOOST SYSTEM RESERVOIR
LH WAIST OBSERVER'S SEAT ON AIRPLANES 135452 THRU 135473)
MARINE MARKER STOWAGE
STOWAGE COMPARTMENT
SONOBUOY COMPARTMENT
GALLEY
LARGE SONOBUOY STOWAGE
LEFT AFT ENTRANCE HATCH
BOW COMPARTMENT
BATTERY JUNCTION BOX
BATTERY COMPARTMENT
FUELING COMPARTMENT
FORWARD ENTRANCE COMPARTMENT
SMALL SONOBUOY STOWAGE
PRACTICE DEPTH CHARGE DISPENSER
ELECTRONICS COMPARTMENT
ENGINE FIRE EXTINGUISHER BOTTLES
MAIN POWER CENTER
BEACHING GEAR COMPARTMENT
JATO STOWAGE
MARINE MARKER RETROEJECTOR

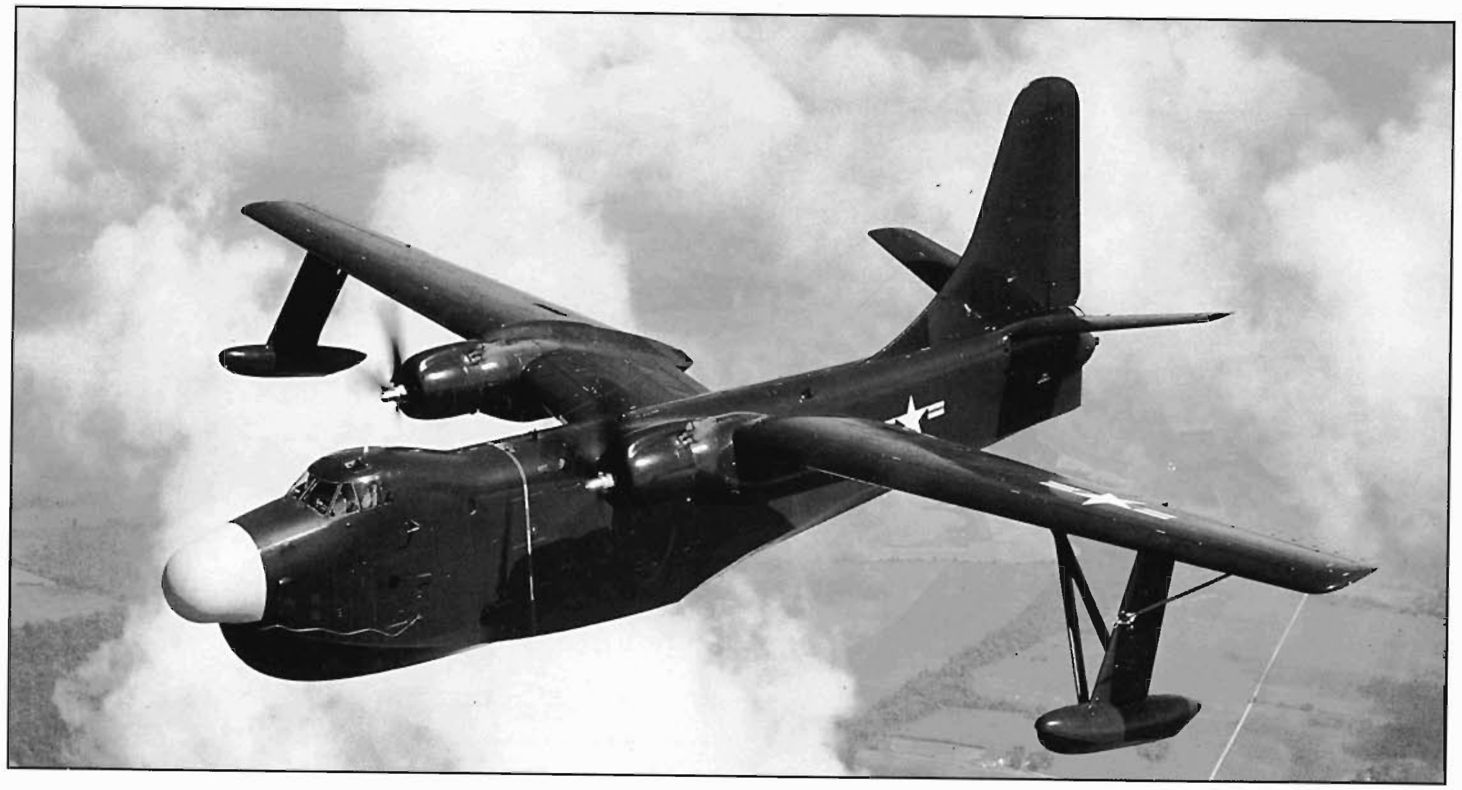


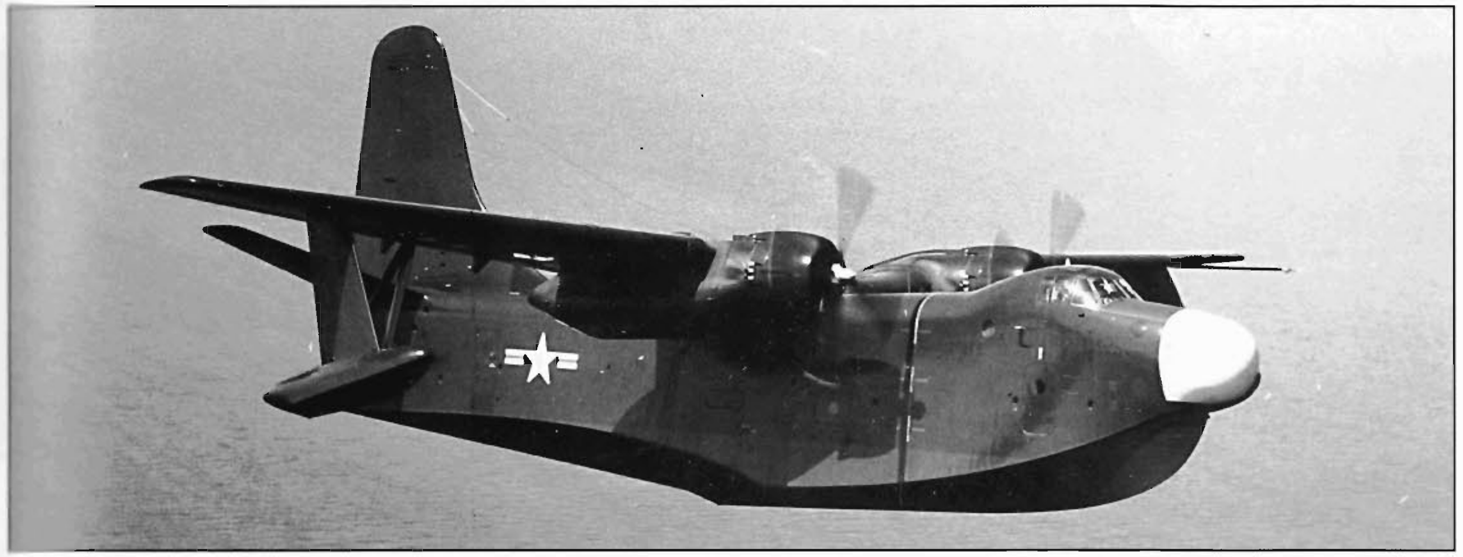
such aircraft as the Lockheed Neptune P2V-5 and P2V-7 series, the Lockheed Super Constellation, the Douglas DC-7, the Canadair Argus maritime patrol plane and the Fairchild C-119 Flying Boxcar.

The turbo-compound engine was a complicated piece of machinery that would undergo many improvements, modifications and fixes during the Marlin's service life. It eventually developed into a very reliable engine that is in service to this day.

In addition to power-boosted controls, production Marlins were equipped with a Martin-designed "hydroflap" system. The hydroflaps were located near the very stern of the aircraft and hydraulically operated. Controlled like conventional toe brakes by the pilot, the hydroflaps could be operated individually for turning or operated together for slowing the aircraft. The hydroflaps and reversing propellers gave Marlin a new dimension in flying boat water maneuverability.

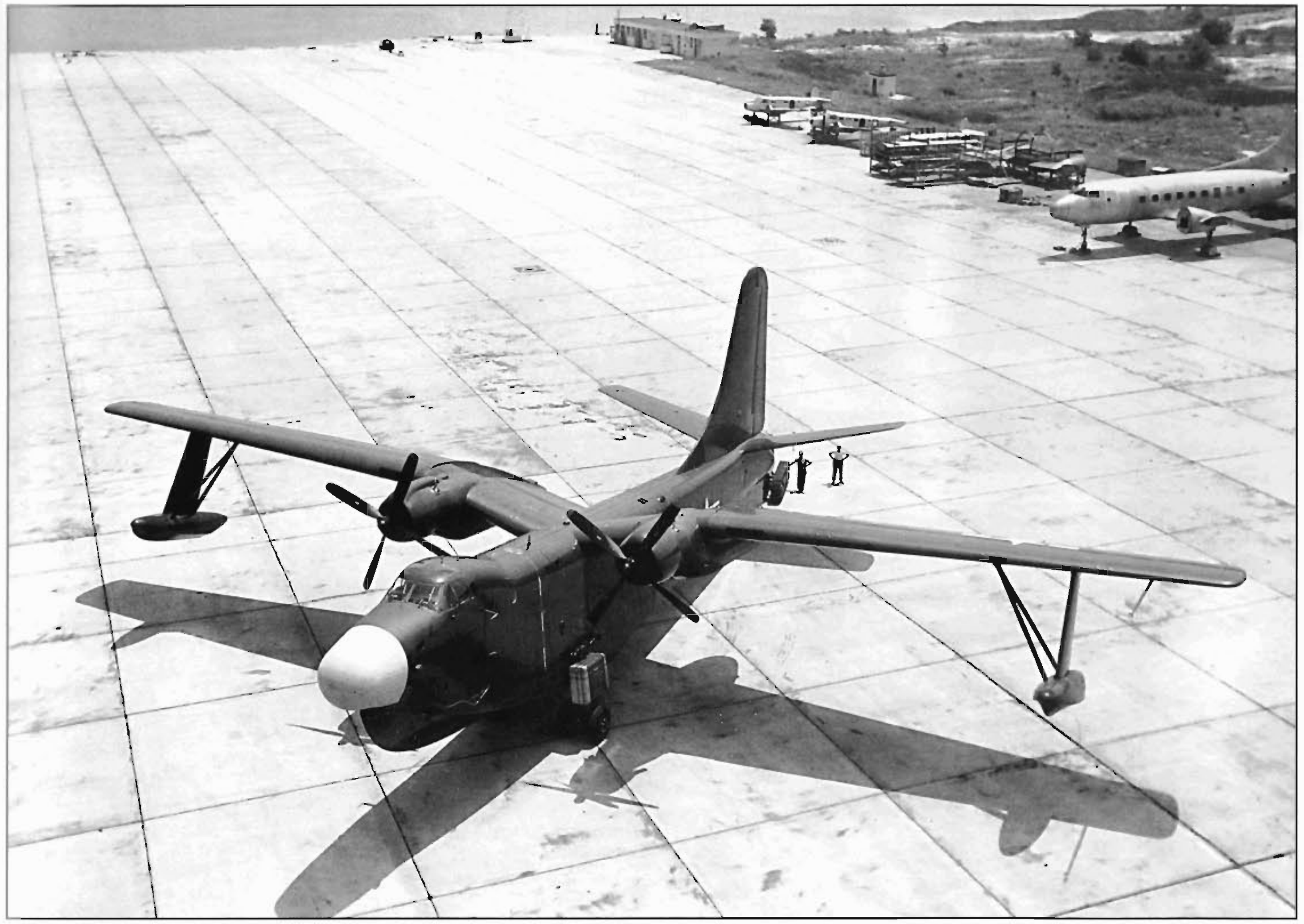
Above and below, the first production aircraft was P5M-1 BuNo 124910 on an early test flight. (Martin)





Operational design gross take-off weight of the Marlin was 75,000 lbs at a 3.0 g load factor. An overload gross weight of 85,000 lbs was permitted at a reduced load factor. The Marlin could mount four Jet Assisted Take-Off (JATO) bottles. In addition to the capability to carry torpedoes, mines, depth charges and bombs in its internal weapons bays, The P5M could carry additional bombs and depth charges as well as up to eight High Velocity Aircraft Rockets (HVARs)

Above, 1st P5M-1 BuNo 124910. (Martin) Below, BuNo 124910 in front of Martin's New River hangar on 11 July 1951. (Martin)

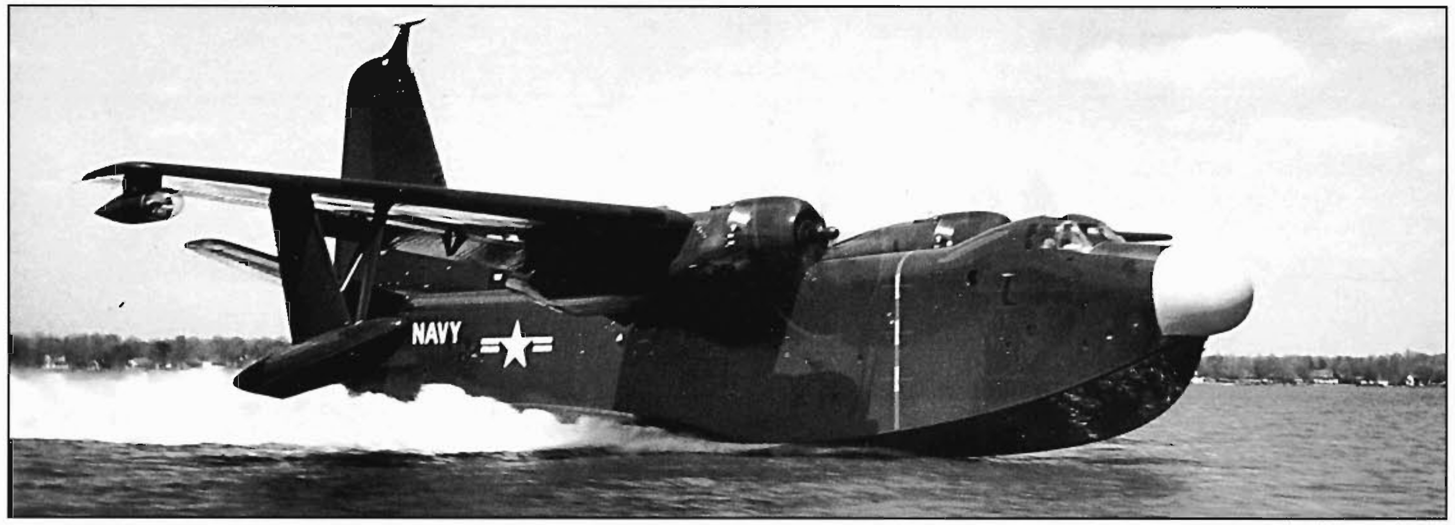


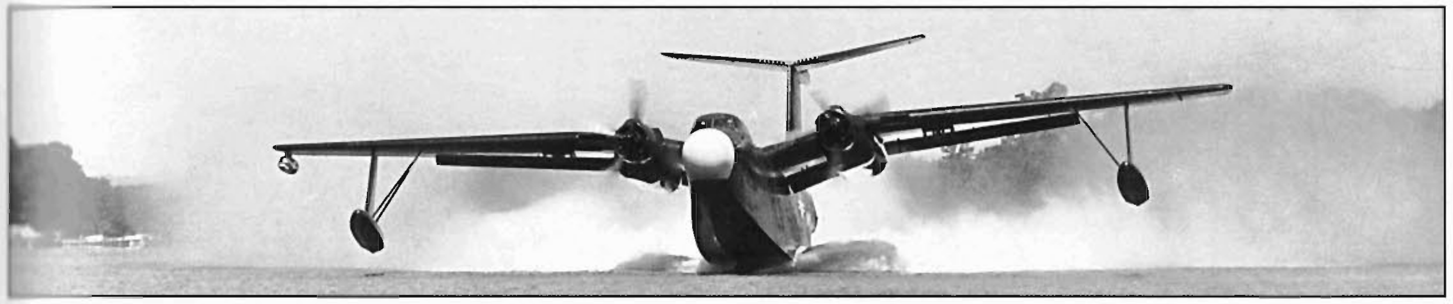
Above and below, three views of P5M-1 takeoffs in 1953. (Martin)

externally on wing stations.

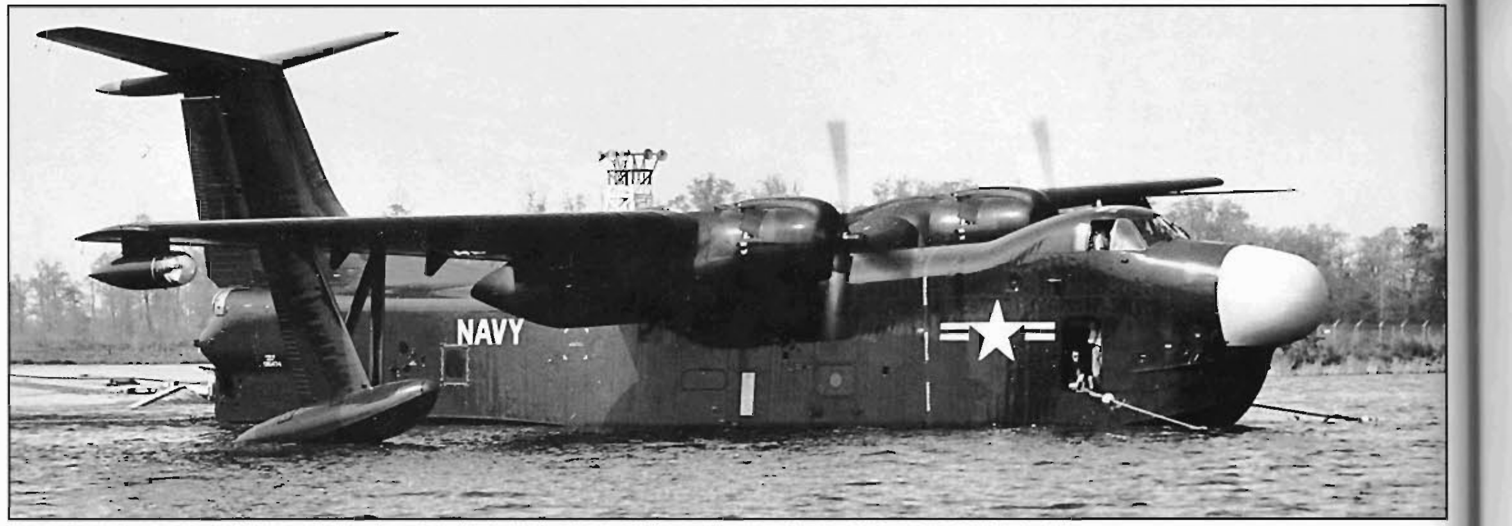
The Marlin interior was divided into fourteen compartments: bow, forward entrance, electronics, main beaching gear, pilot's, flight deck, fuel, Auxiliary Power Unit (APU), sonobuoy, forward waist, aft waist, storage, hydraulics and tail gunner's. There were three watertight doors installed in the bulkheads at the aft end of the forward entrance compartment, at the aft end of the electronics compartment and at the aft end of the beaching gear compartment.

The first production Marlin's initial flight was on 21 June 1951 and the first four production aircraft were delivered to the Naval Air Test Center (NATC), Patuxent River, MD, in December. Fleet deliveries to VP-44 in Norfolk began in March 1952 and VP-49, based at NAS Bermuda, began transition to the Marlin in December. USN Aircraft History





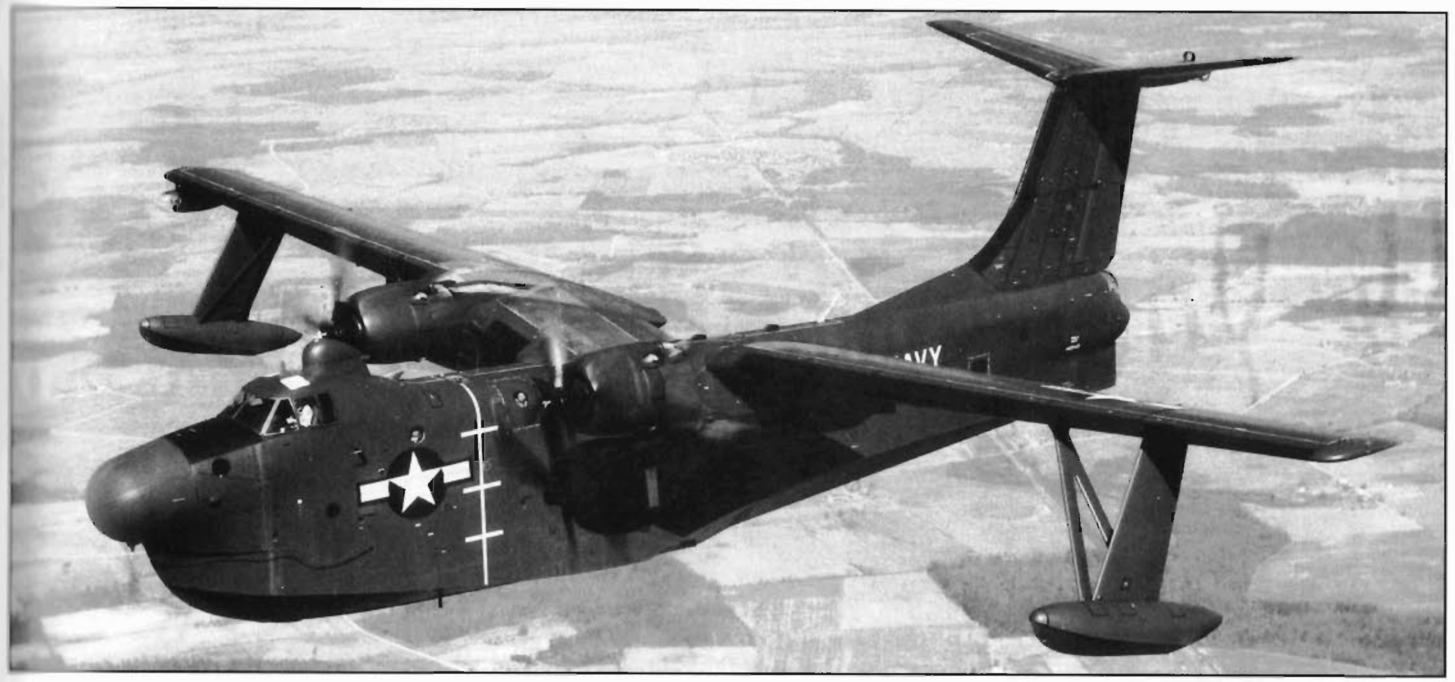
Four views of T-tailed P5M-2's takeoffs and landings. (Martin)



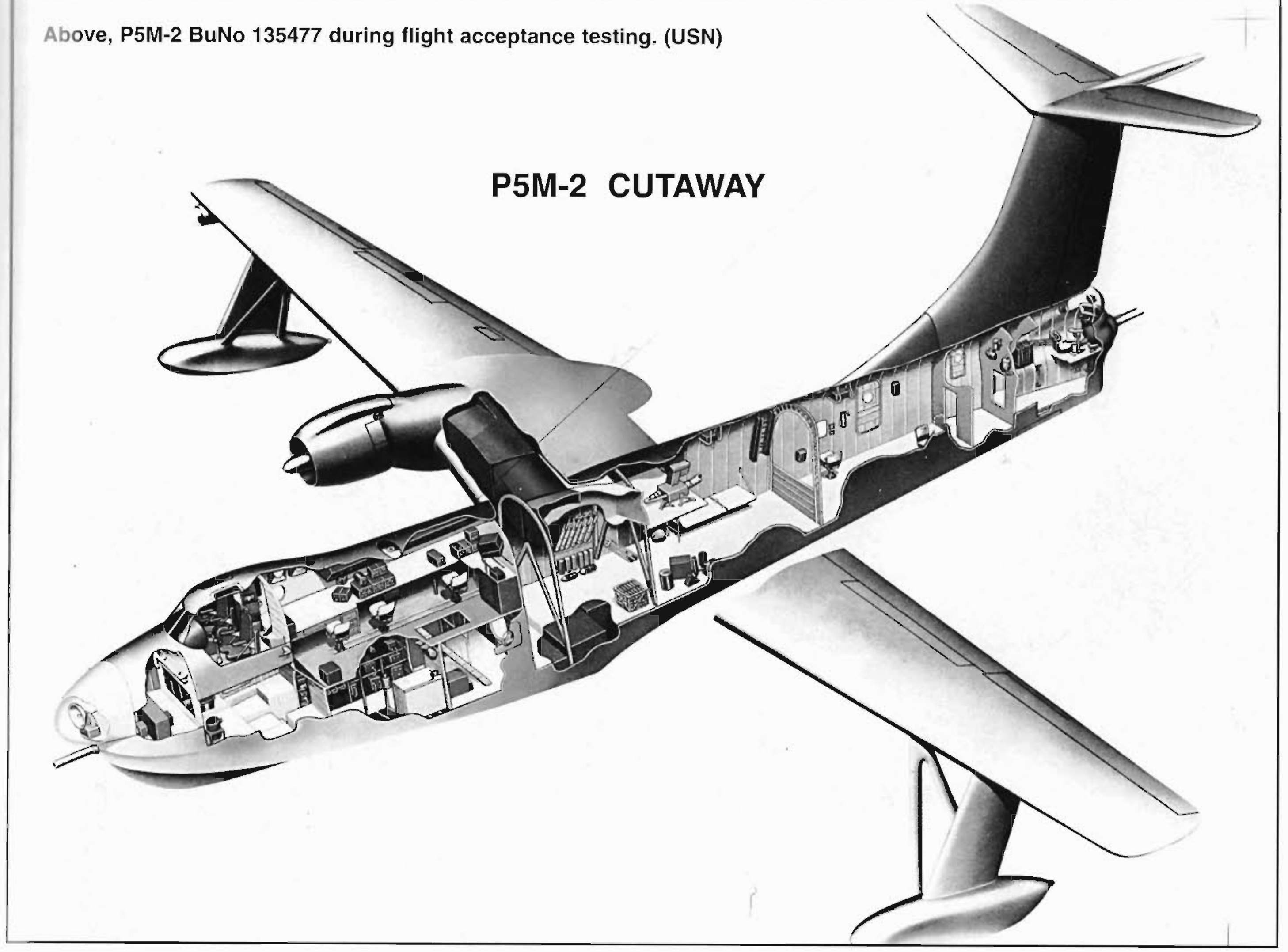
Above, P5M-2 runs its engines prior to a takeoff run on 7 May 1954. (Martin) At left, P5M-2 on take-off run. Early -2s had tail turrets installed but guns were not always installed. (Martin) Below, early P5M-2 in flight near Baltimore. (Martin)

Cards show that a total of 30 aircraft were delivered in 1952.

Production in 1953 totaled 63 aircraft. VP-40 (San Diego) transitioned from the Mariner to the Marlin in April, VP-56 (Norfolk) in May, VP-46 (San Diego) in September and VP-42 (San Diego) in November. One aircraft of the 1953 production run, BuNo 130286, was fitted with the "T" tail proposed for the P5M-2. Aside from the new tail, this aircraft was a stock P5M-1 and retained the P5M-1 designation in Navy records. It served with VP-46 and VP-48 until stricken in



Above, P5M-2 BuNo 135477 during flight acceptance testing. (USN)



October 1962. 22 more P5M-1s were delivered between January and April 1954 with VP-45 based at Coco Solo, Canal Zone, transitioning in April 1954 and VP-48 at San Diego transitioning in June. Delivery of the first of seven Coast Guard P5M-1Gs for evaluation had been on 20 November 1953. Delivery of the remaining six was in the fall of 1954. The P5M-1Gs had been specially lightened for the Coast Guard open-sea rescue mission by the removal of all military equipment and by the replacement of the AN/APS-44A radar with the much lighter AN/APS-33.

Above, head-on view of an early P5M-2 near Baltimore. (Martin) Below, two P5M-2s at anchor off Martin's New River seaplane ramp. (Martin)

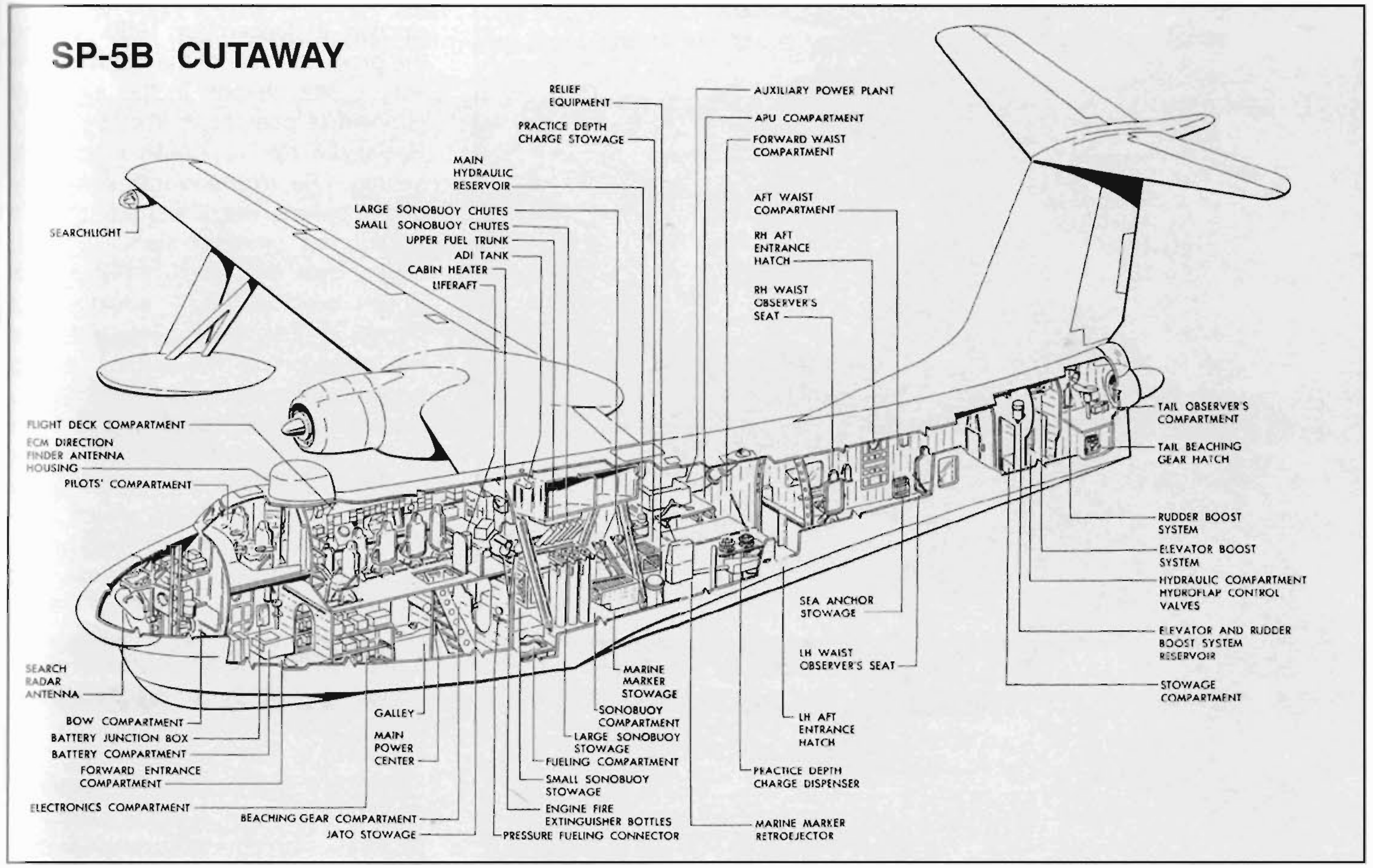
P5M-1 production ended in April 1954 after production of 114 for the Navy and seven for the U.S. Coast Guard.

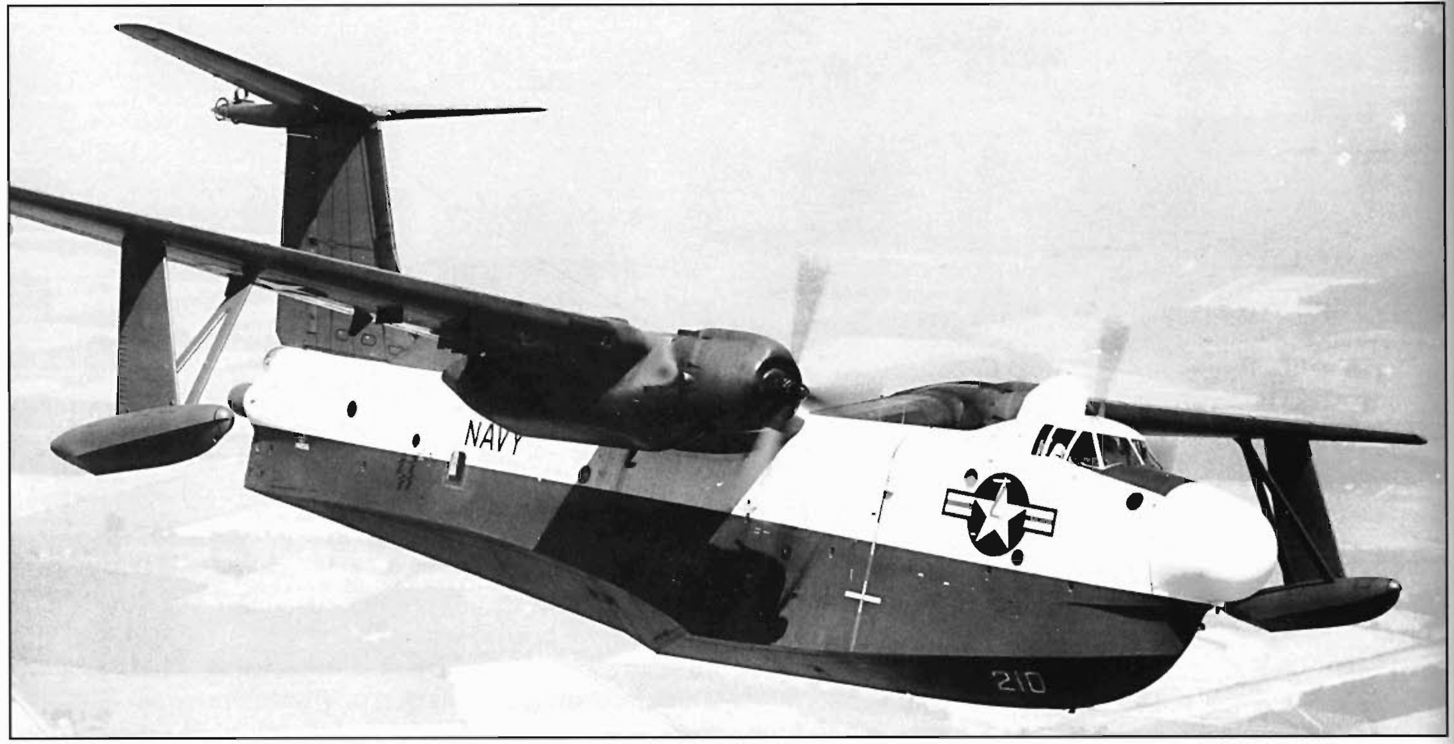
Deliveries of the P5M-2 began in April 1954. The obvious changes in the –2 were the "T" tail and a reconfigured bow. Although the author has been unable to find any exact weight comparison between the two, the "T" tail was reportedly lighter than the conventional tail of the –1. The "T" tail configuration raised the horizontal stabilizers so that they would be less susceptible to spray damage in rough water operations and the new bow configuration reduced spray into the propellers. Minor interior changes were made to improve crew accommodations, but the ASW equipment remained the same as in the –1.

The –2 was fitted with the 3,450 HP Wright R-3350-32W or -32WA engine. After Aircraft Service Change (ASC) 447, these engines were fitted with water injection. Operational design gross weight was increased to 78,000lbs.

VP-47 (Alameda) transitioned to the P5M-2 in October 1954 and VP-50 (Alameda) in June 1956. Delivery of the –2 would continue at a mea-

Above, 2nd P5M-2 BuNo 135475 on 1 April 1955. (Martin)


SP-5B CUTAWAY
RELIEF EQUIPMENT
PRACTICE DEPTH CHARGE STOWAGE
MAIN HYDRAULIC RESERVOIR
LARGE SONOBUOY CHUTES
SMALL SONOBUOY CHUTES
UPPER FUEL TRUNK
ADI TANK
CABIN HEATER
LIFERAFT
SEARCHLIGHT
AUXILIARY POWER PLANT
APU COMPARTMENT
FORWARD WAIST COMPARTMENT
AFT WAIST COMPARTMENT
RH AFT ENTRANCE HATCH
RH WAIST OBSERVER'S SEAT
TAIL OBSERVER'S COMPARTMENT
TAIL BEACHING GEAR HATCH
RUDDER BOOST SYSTEM
ELEVATOR BOOST SYSTEM
HYDRAULIC COMPARTMENT HYDROFLAP CONTROL VALVES
ELEVATOR AND RUDDER BOOST SYSTEM RESERVOIR
STOWAGE COMPARTMENT
FLIGHT DECK COMPARTMENT
ECM DIRECTION FINDER ANTENNA HOUSING
PILOTS' COMPARTMENT
SEARCH RADAR ANTENNA
BOW COMPARTMENT
BATTERY JUNCTION BOX
BATTERY COMPARTMENT
FORWARD ENTRANCE COMPARTMENT
ELECTRONICS COMPARTMENT
GALLEY
MAIN POWER CENTER
BEACHING GEAR COMPARTMENT
JATO STOWAGE
MARINE MARKER STOWAGE
SONOBUOY COMPARTMENT
LARGE SONOBUOY STOWAGE
FUELING COMPARTMENT
SMALL SONOBUOY STOWAGE
ENGINE FIRE EXTINGUISHER BOTTLES
PRESSURE FUELING CONNECTOR
SEA ANCHOR STOWAGE
LH WAIST OBSERVER'S SEAT
LH AFT ENTRANCE HATCH
PRACTICE DEPTH CHARGE DISPENSER
MARINE MARKER RETROEJECTOR



Above, two-tone SP-5B in flight near Baltimore. (Martin) At left, six P5M-1s on the Martin ramp awaiting delivery to the Navy on 27 May 1953. (Martin)

sured pace until the end of Marlin production in December 1960. During the production life of the Marlin, there was a sea change in the air ASW concept of operations from SIGINT / Radar search to passive acoustic search. After World War II, sonobuoy development was limited to the broadband omnidirectional SSQ-2, which was first deployed in 1950. Buoys like the SSQ-2 could detect targets at reasonable range but gave no indication of the target bearing necessary for localization and attack. Sonobuoys had proved useful as a tool for target classification and attack analysis, but could not replace radar as the primary air ASW search sensor. Development of directional buoys was in process, but this development had proven difficult.

In 1950, the Navy had established the Project Hartwell Committee under Massachusetts Institute of Technology (MIT) leadership. It was named in honor of Dr. G. P. Hartwell, Deputy Chairman of the Committee for Undersea Warfare and professor at the University of Pennsylvania. The project objective was to structure a long-range defense against submarines. Concluding that detection of low frequency sound was the answer to the snorkeling diesel submarine problem, the Committee recommended $10 million of R&D funding annually to be applied toward development of an effective, long range, acoustic detection sensor system using bottomed hydrophone arrays. Part of the approach was Project Jezebel, a Bell Telephone Labs (BTL) investigation of low frequency signal analysis. In October 1950 a letter contract was issued to the Western Electric Company (WECO) to design and build Sound Surveillance System (SOSUS) arrays and by 1954 the first SOSUS station was operational. The development and deployment of SOSUS accelerated the development of air acoustic ASW. SOSUS, and the Jezebel low frequency detection and signal processing advances associated with it, not only led to a demand for better air ASW capabilities, it provided the means of achieving them. The demand was for a means of quickly prosecuting a SOSUS detection and the solution was to give VP aircraft the ability to search SOSUS probability areas and to localize submarines within them using passive acoustics. The answer to this tactical challenge was what became known as the airborne Julie/Jezebel System, which used different signal processing techniques with the same low frequency (LF) sonobuoys for localization and search respectively. The first LF sonobuoy was the omnidirectional SSQ-23 deployed in 1957.

Above and below, SP-5B in flight with underwing fuel tanks in the later two-tone white and blue scheme. (Martin)

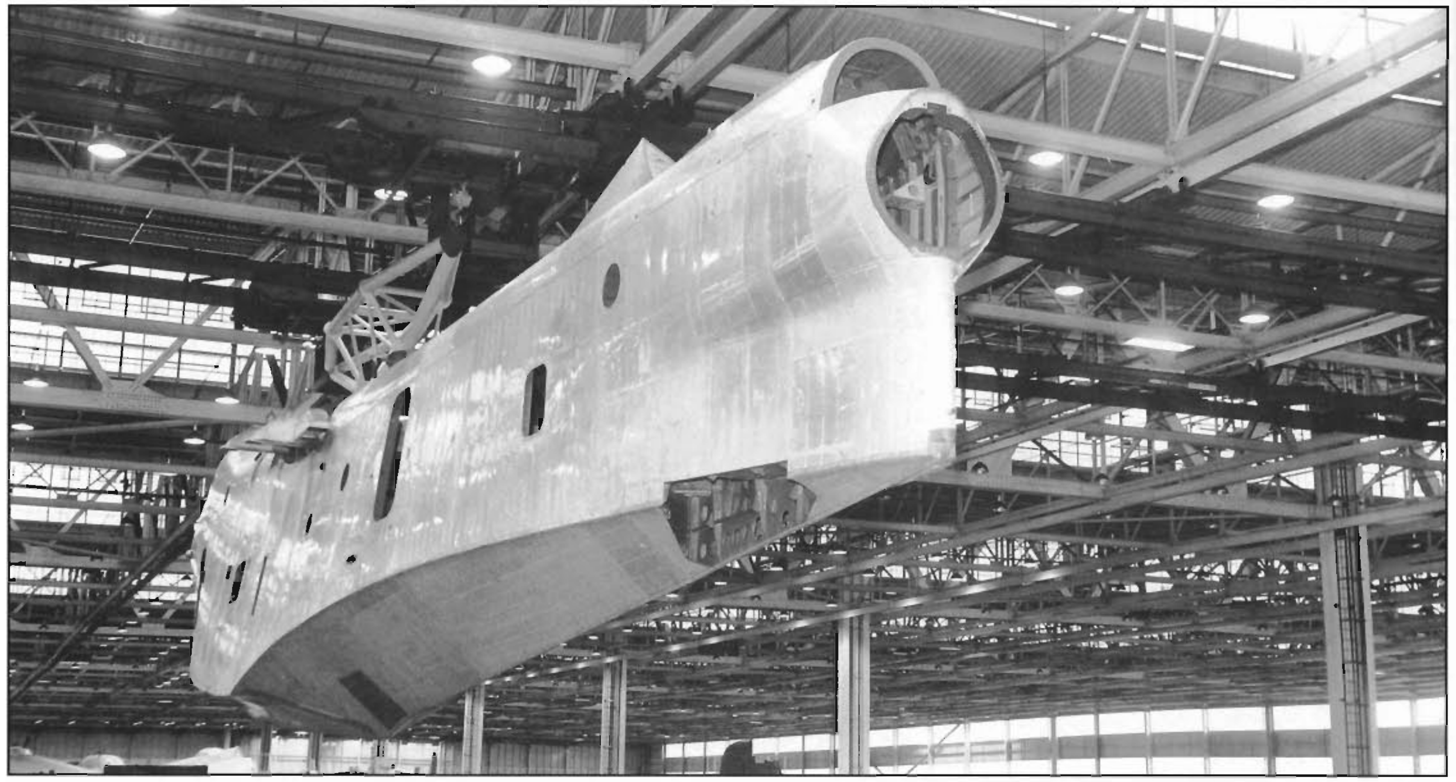
P5M-2
NAVY
135523

Above and below, P5Ms under construction on 29 June 1954. (Martin)

Jezebel attacked the search problem by applying Low Frequency Analysis and Recording (LOFAR) processing to the output of the SSQ-23, which gave buoys extraordinary initial detection ranges, although with little or no bearing or range resolution. Bearing data was obtained by the Correlation Display Analysis Ranging (CODAR) technique.

CODAR used two precisely spaced SSQ-23s to detect and correlate broadband LF signals using the time difference of arrival method. When successful, the first CODAR pair gave an ambiguous bearing, and another pair of buoys was necessary to resolve the bearing ambiguity. Additional pairs were necessary to obtain a fix by cross-bearings.

Julie was the active localization technique. Julie used small explosive sound sources called Practice Depth Charges (PDCs). After planting an array of SSQ-23s around the CODAR fix, the aircraft would "bomb" each buoy with a PDC until it received an echo return. The Julie system, developed at the Naval Air Development Center (NADC), Johnsville, PA, was named after an exotic dancer in the Philadelphia area, Julie Gibson. Since Julie Gibson was able to make "passive boys active", her name seemed to be an apropos title for the system. After CODAR and/or Julie localization, the aircraft would seek Magnetic Anomaly Detection (MAD) contact as the final step before release of a homing torpedo.

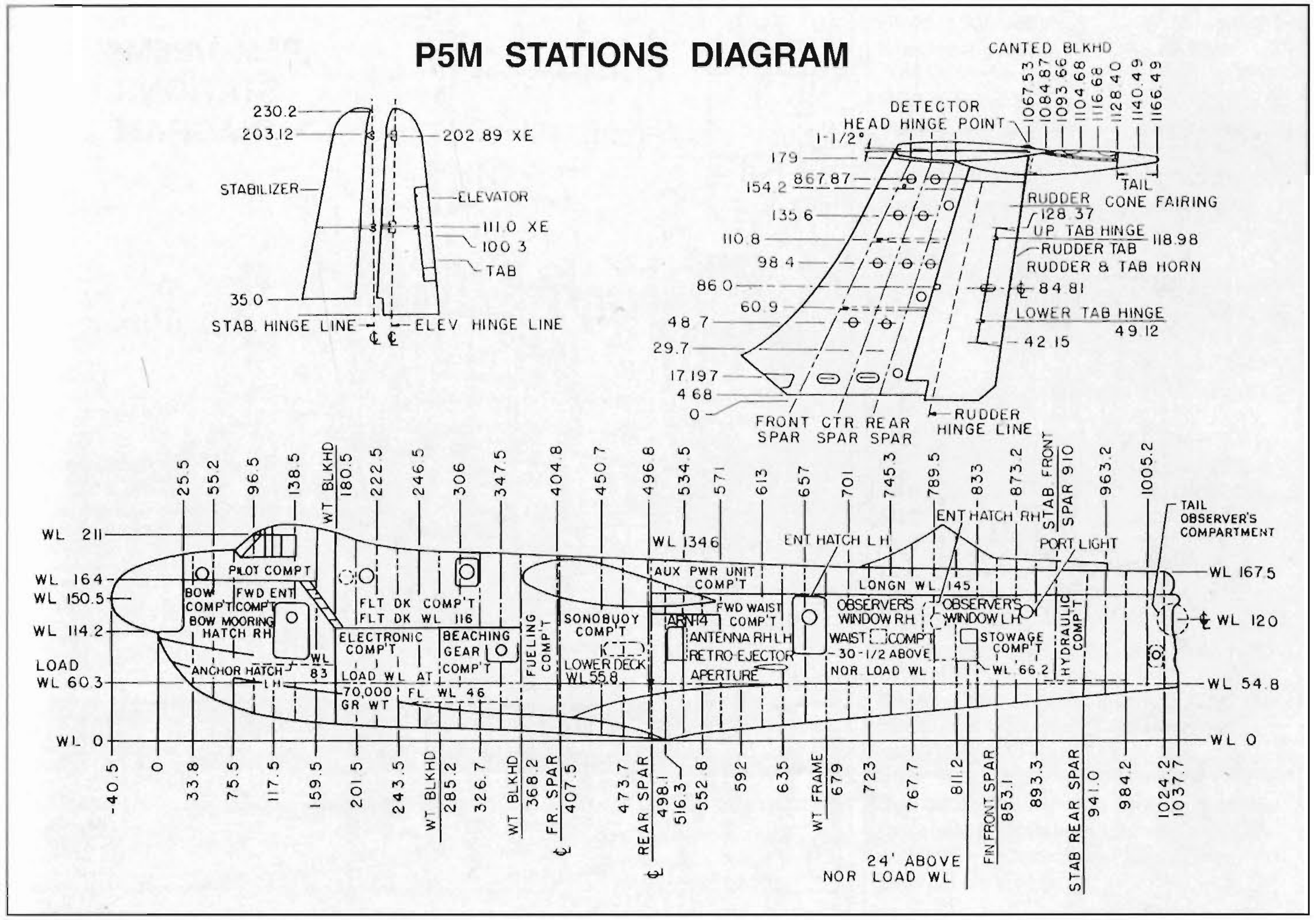


Localization was the weak link in the chain. As a broadband system, CODAR lacked Jezebel's range and often failed to acquire the target that LOFAR Jezebel had initially detected. Even when it did, it took time for the four buoys or more to be placed and against diesel submarines, this time often exceeded the snorkel period. Once the target stopped snorkeling, CODAR was not very effective and the target would often be lost. As an active system, Julie was effective against submarines on battery, but it had even less range than CODAR, which made Julie localization of Jezebel detections extremely difficult.

Successful application of Jezebel, CODAR, and Julie demanded great skill of the operators. The need for the correlation and analysis of the acoustic information led to the development of computer-assisted tactical displays. The Marlin was outfitted with one of the first integrated display systems.

In 1957, the Martin Company, working with NADC, designed and installed a new ASW equipment suite for the Marlin. Described as Aircraft Service Change (ASC) 439, this was an integrated system of new equipment and displays. A complete Julie/Jezebel system was installed. ASW information was processed through the AN/APA-125 Aircraft Integrated Display System (AIDS), for evaluation by a new crewmember, the Tactical Coordinator (TC or TACCO). The tactical situation was presented to the pilot by the TACCO on a Ground Track Plotter (GTP) display in the cockpit. Sonobuoy and PDC launching was mechanized. The AN/APS-44A radar was replaced with the AN/APS-80, a simpler, lighter and more modern design used in the P3 Orion to this day. The AN/APS-44A had been technically satisfactory, but was of limited tactical use in detecting periscopes or snorkels. Like all radars of the day, its detection performance decreased with increasing sea state and its powerful signal alerted the target submarine at ranges far beyond detection range. The AN/APA-69A direction-finding Electronics Countermeasures (ECM) equipment and an improved AN/ASQ-8 MAD was added as part of the new system.

In late 1958 Air Development One Squadron (VX-1), then based at Key West, FL, received P5M-2 BuNo 141255, with the ACS 439 flight deck installed. VX-1 was given the task to determine the operational feasibility of using a tactical coordinator to direct and assist with on-scene tactics, and if feasible whether the tactical coordinator's station should be manned by an officer or an enlisted man.


P5M STATIONS DIAGRAM
STABILIZER
ELEVATOR
TAB
STAB HINGE LINE
ELEV HINGE LINE
CANTED BLKHD
DETECTOR HEAD HINGE POINT
TAIL CONE FAIRING
RUDDER
UP TAB HINGE
RUDDER TAB
RUDDER & TAB HORN
LOWER TAB HINGE
FRONT SPAR
CTR SPAR
REAR SPAR
RUDDER HINGE LINE
TAIL OBSERVER'S COMPARTMENT
PILOT COMPT
BOW COMP'T
FWD ENT COMP'T
BOW MOORING HATCH RH
ANCHOR HATCH LH
FLT DK COMP'T
FLT DK WL 116
ELECTRONIC COMP'T
BEACHING GEAR COMP'T
LOAD WL AT 70,000 GR WT
FUELING COMP'T
SONOBUOY COMP'T
LOWER DECK WL 55.8
AUX PWR UNIT COMP'T
FWD WAIST COMP'T
ANTENNA RH LH
RETRO-EJECTOR APERTURE
ENT HATCH LH
ENT HATCH RH
OBSERVERS WINDOW RH
OBSERVERS WINDOW LH
WAIST COMP'T
STOWAGE COMP'T
HYDRAULIC COMP'T
PORT LIGHT
LONGN WL 145
30-1/2 ABOVE NOR LOAD WL
24' ABOVE NOR LOAD WL
WL 211
WL 164
WL 150.5
WL 114.2
LOAD WL 60.3
WL 0
WL 167.5
WL 120
WL 54.8
WT BLKHD
FR. SPAR
REAR SPAR
FIN FRONT SPAR
STAB REAR SPAR
STAB FRONT SPAR

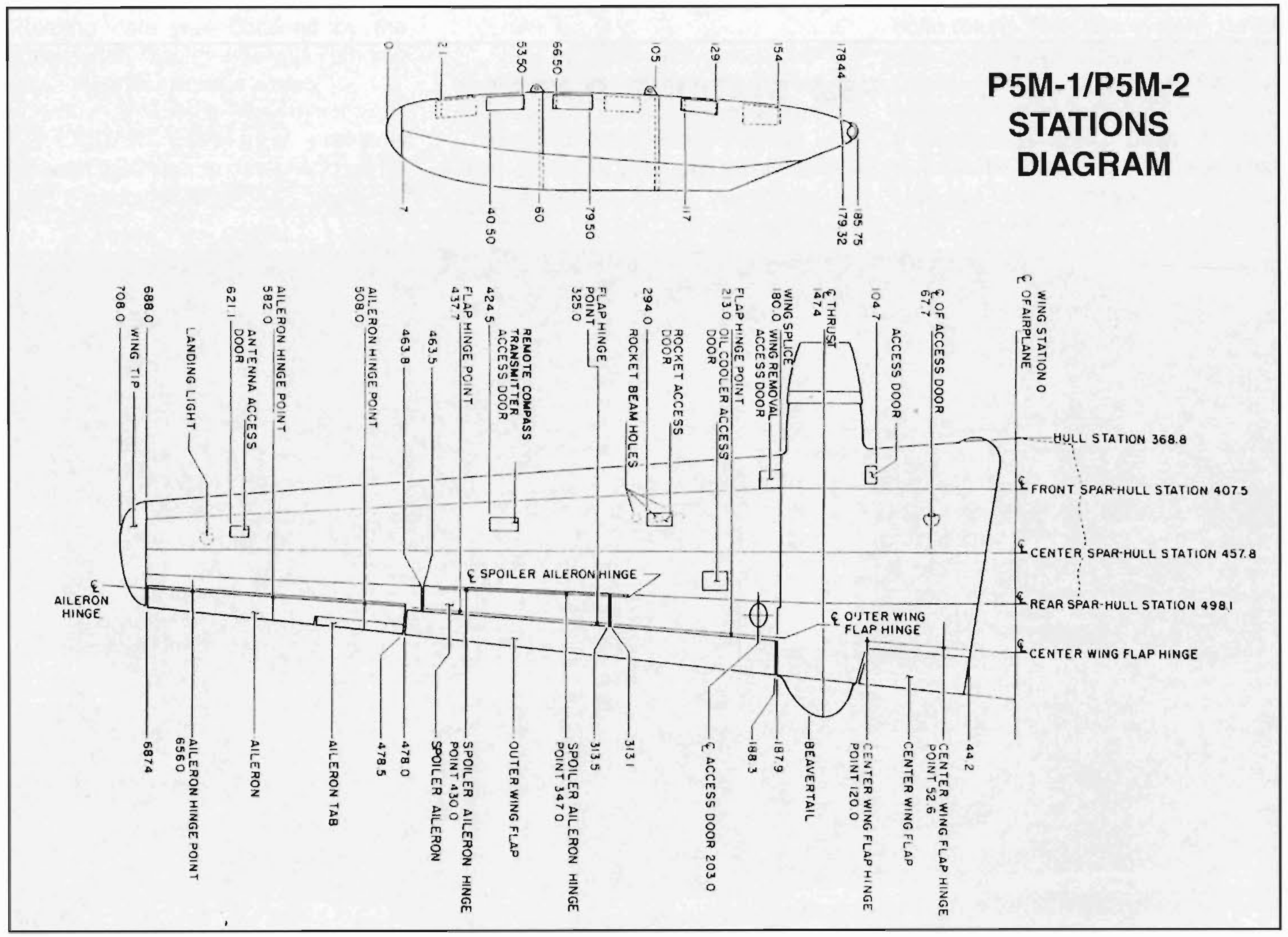
LCDR George W. East was the project officer, assisted by LT Harvey Gray Jr., LTJG Norman L. DeNoon, Warrant Officer Dwayne M. McGaa, and several well-qualified Aviation Electronic Technicians including ATC Roy E. Ramsey and AT2 Edwin B. Leach. ADC Leonard J. Riccio and ADC Thomas H. Crapps flew as plane captains, and AO1 William C. Churchwell Jr. was the ordnanceman. The project plan had the crew conduct various Antisubmarine Warfare Operations (ASW) against actual submarines from the submarine squadron based at Naval Station Key West. Both officer and enlisted crewmembers were rotated through the Tactical Coordinator Station.

These operations determined that the tactical coordinator position was a valuable addition to the patrol plane crew to be able to process the wealth of additional tactical information obtained by the new methods for detecting submarines operating on and below the surface of the ocean. The final Operational Test and Evaluation Force (OPTEVFOR) report on this project recommended that the Tactical Coordinator Station be added to all ASW patrol aircraft and that the position of Tactical Coordinator be manned by an officer. Both officer and enlisted personnel in the tactical coordinator station performed outstandingly during these tests, but other considerations led the project team to recommend that the TC position be manned by an officer during fleet operations.

Following this project, P5Ms and P2V's were configured with tactical coordinator's stations, and the concept was designed into the P-3 aircraft that entered the fleet in the 1960's.

Installation of ASC 439 into 85 P5M-1s and 28 early production P5M-2s took place at the Martin factory 1957-59. New production P5M-2s had the change incorporated while in the production line. After ASC 439 was installed, the aircraft were designated P5M-1S and P5M-2S respectively (After 1962 the aircraft designations became SP-5A and SP-5B). The ASC 439 project was also used to correct serious corrosion problems in early aircraft that had been caused by the extensive use of magnesium. When a Marlin completed ASC 439 Martin Company rework, it was considered the same "zero time" as a new aircraft.

Production of the P5M-2 continued until December 1960. 103 were delivered to the Navy, four to the U.S. Coast Guard and 10 to the French Navy. Total Marlin production was 238 aircraft, 121 P5M-1s and 117 P5M-2s.


P5M-1/P5M-2 STATIONS DIAGRAM

WING STATION 0 ℄ OF AIRPLANE
℄ OF ACCESS DOOR 67.7
ACCESS DOOR 104.7
℄ THRUST 147.4
WING SPLICE 180.0 WING REMOVAL ACCESS DOOR
FLAP HINGE POINT 213.0 OIL COOLER ACCESS DOOR
ROCKET ACCESS DOOR 294.0
ROCKET BEAM HOLES
FLAP HINGE POINT 325.0
REMOTE COMPASS TRANSMITTER ACCESS DOOR 424.5
FLAP HINGE POINT 437.7
463.5
463.8
AILERON HINGE POINT 508.0
AILERON HINGE POINT 582.0
ANTENNA ACCESS DOOR 621.1
LANDING LIGHT
WING TIP 688.0
708.0
HULL STATION 368.8
℄ FRONT SPAR-HULL STATION 407.5
℄ CENTER SPAR-HULL STATION 457.8
℄ REAR SPAR-HULL STATION 498.1
℄ CENTER WING FLAP HINGE
℄ OUTER WING FLAP HINGE
℄ SPOILER AILERON HINGE
℄ AILERON HINGE
CENTER WING FLAP HINGE POINT 52.6
44.2
CENTER WING FLAP
CENTER WING FLAP HINGE POINT 120.0
BEAVERTAIL
187.9
188.3
℄ ACCESS DOOR 203.0
313.1
313.5
SPOILER AILERON HINGE POINT 347.0
OUTER WING FLAP
SPOILER AILERON HINGE POINT 430.0
SPOILER AILERON
478.0
478.5
AILERON TAB
AILERON
AILERON HINGE POINT 656.0
687.4

MARTIN P5M MARLIN DESCRIBED

	P5M-1	P5M-2
Wing Span	118'2"	118'2"
Length	92'3"	100'2"
Height	35'2"	30'11"
Width	10'	10'
Max Weight, lbs	73,000	78,000
Max Speed	269 mph	276 mph
Cruise Speed	157 mph	159 mph
Range, miles	3,000	3,000
Service Ceiling	21,000 ft	21,000 ft
Fuel, gal	3.959	3,993
Engines P5M-1	R-3350-30WA 3,250 H.P.	
P5M-2	R-3350-32WA 3,450 H.P.	

P5M-2 PARTICULARS

HULL:

Width with beaching gear	15'7"
Height on beaching gear -fin	21'7"

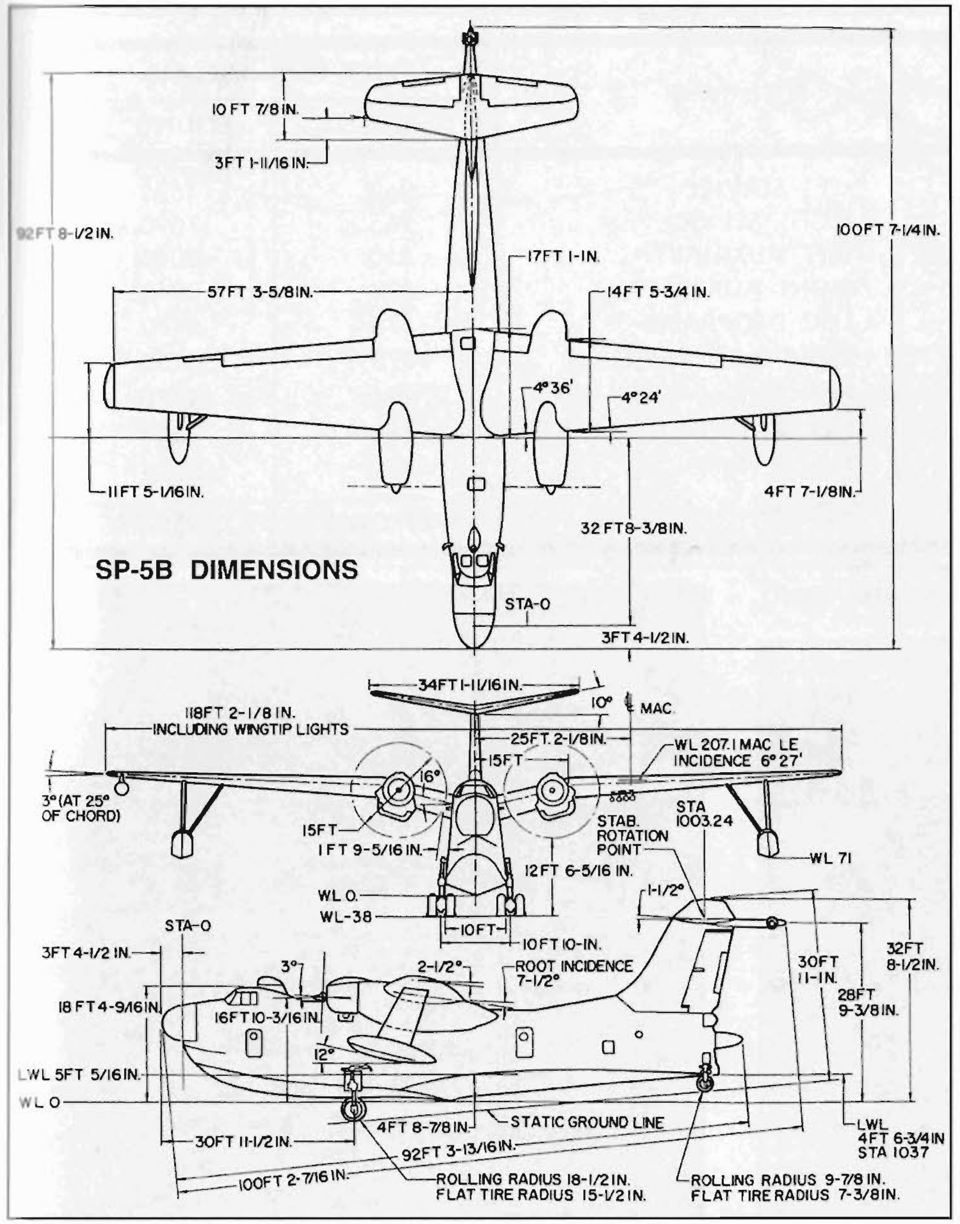
Height of doors above ground (static):	
Forward LH hatch	11'7-3/8"
Forward RH hatch	11'7-3/8"
Rear LH hatch	8'0"
Rear RH hatch	6'10"
Height of doors above load waterline:	
Forward LH hatch	2'1"
Forward RH hatch	2'1"
Rear LH hatch	2'6"
Rear RH hatch	2'0"
WINGS:	
Airfoil at root	NACA 23020
Airfoil at tip	NACA 4412
Chord at root	17'1"
Chord near tip	6'10"
Mean aerodyn. chord	12'8-1/2"
Incidence at root	7°30'
Incidence at tip	2°30'
Dihedral center wing	16° C/4

Dihedral outer wing	3° C/4
Aspect ratio	9.9
Taper ratio	2.5/1
Sweepback center wing	4°36'
Sweepback outer wing	4°24'
EMPENNAGE:	
Vertical tail at root	NACA 63A-12
Vertical tail at tip	NACA 63A-10
Incidence	0°
Horizontal tail at root	NACA 65-12.8 (modified)
Horizontal tail at tip	NACA 65-10 (modified)
Incidence	1°30'
Dihedral	10°
Span	34'1-11/16"
Maximum chord	10'7/8"
AREAS:	
Wing	1,406.33 sq ft
Ailerons including tabs	60.80 sq ft
Aileron tab area	5.13 sq ft
Aileron Spoiler Area	46.49 sq ft
Flap area	204.30 sq ft
Stabilizers inc. elevators	258.49 sq ft
Elevators inc. trim tabs	86.4 sq ft
Elevator trim tabs	7.45 sq ft
Vertical fin inc. dorsal	216.96 sq ft
Rudder inc. tabs	47.65 sq ft
Rudder trim tabs	6.35 sq ft
MISSION WEIGHT:	
ASW (2,843 gal fuel)	74,601 lbs
Mine laying (2,843 gal0	77,531 lbs
Ferry (3,993 gal)	78,140 lbs
Maximum overload	85,000 lbs
DRAFT:	
49.5"	at 54,000 lbs
52.0"	at 60,000 lbs
54.2"	at 66,000 lbs
56.3"	at 72,000 lbs
58.5"	at 78,000 lbs
DRAFT WITH BEACHING GEAR:	
87.5"	at 54,000 lbs
90.0"	at 60,000 lbs
92.2"	at 66,000 lbs
94.3"	at 72,000 lbs
96.5"	at 78,000 lbs

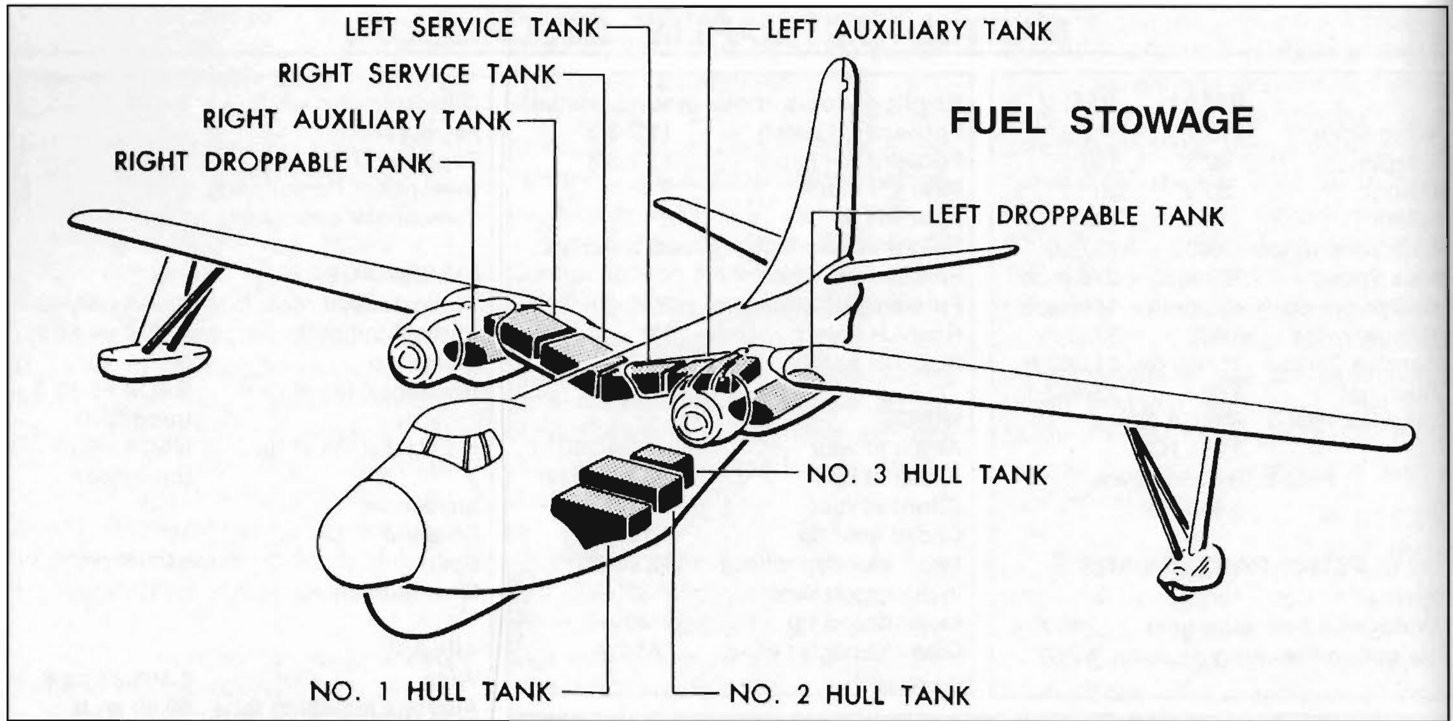
CREW ASW:

Before ASC-439: Pilot, Copilot, Radio Operator, Navigator, Plane Captain, Radar Operator, Sonobuoy Operator, ECM/MAD Operator, Tail Observer

After ASC-439: Pilot, Copilot, Radio Operator, Navigator, Plane Captain, Radar/MAD Operator, Jezebel Operator, Julie/ECM Operator, Tail Observer, Tactical Coordinator

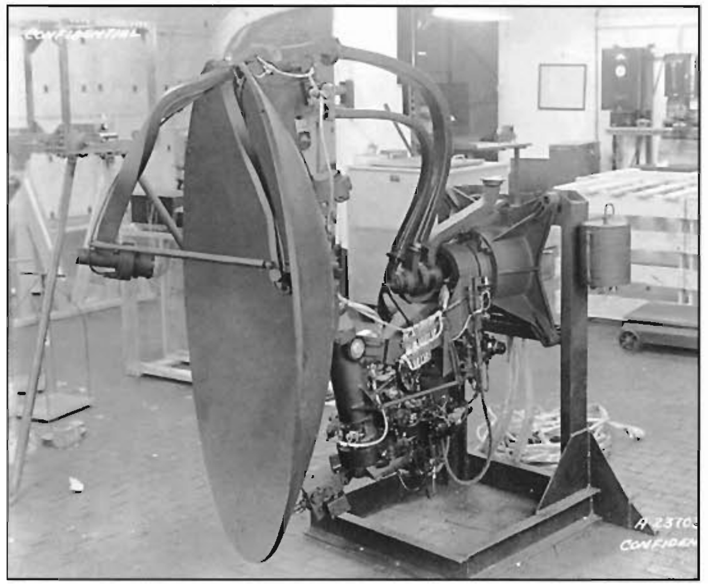

SP-5B DIMENSIONS

10 FT 7/8 IN.
3FT 1-11/16 IN.
92FT 8-1/2 IN.
100FT 7-1/4 IN.
17FT 1-IN.
57FT 3-5/8 IN.
14FT 5-3/4 IN.
4°36'
4°24'
11 FT 5-1/16 IN.
4FT 7-1/8 IN.
32 FT 8-3/8 IN.
STA-0
3FT 4-1/2 IN.
34FT 1-11/16 IN.
10°
℄ MAC
118FT 2-1/8 IN. INCLUDING WINGTIP LIGHTS
25FT 2-1/8 IN.
15FT
16°
WL 207.1 MAC LE INCIDENCE 6° 27'
3° (AT 25° OF CHORD)
STA 1003.24
STAB. ROTATION POINT
WL 71
15FT
1 FT 9-5/16 IN.
12FT 6-5/16 IN.
1-1/2°
WL 0
WL-38
10FT
10FT 10-IN.
STA-0
3FT 4-1/2 IN.
3°
2-1/2°
ROOT INCIDENCE 7-1/2°
30FT 11-IN.
32FT 8-1/2 IN.
28FT 9-3/8 IN.
18 FT 4-9/16 IN.
16FT 10-3/16 IN.
12°
LWL 5FT 5/16 IN.
WL 0
4FT 8-7/8 IN.
STATIC GROUND LINE
LWL 4FT 6-3/4 IN STA 1037
30FT 11-1/2 IN.
92FT 3-13/16 IN.
100FT 2-7/16 IN.
ROLLING RADIUS 18-1/2 IN. FLAT TIRE RADIUS 15-1/2 IN.
ROLLING RADIUS 9-7/8 IN. FLAT TIRE RADIUS 7-3/8 IN.


LEFT SERVICE TANK
LEFT AUXILIARY TANK
RIGHT SERVICE TANK
RIGHT AUXILIARY TANK
FUEL STOWAGE
RIGHT DROPPABLE TANK
LEFT DROPPABLE TANK
NO. 3 HULL TANK
NO. 1 HULL TANK
NO. 2 HULL TANK

BEFORE P5M–ASC–448		FUEL TANK	AFTER P5M–ASC–448	
GALLONS	POUNDS		GALLONS	POUNDS
262	1572	LEFT SERVICE	262	1572
265	1590	RIGHT SERVICE	265	1590
510	3060	LEFT AUXILIARY	510	3060
508	3048	RIGHT AUXILIARY	508	3048
575	3450	LEFT DROPPABLE	575	3450
575	3450	RIGHT DROPPABLE	575	3450
285	1710	NO. 1 HULL	295	1770
571	3426	NO. 2 HULL	584	3504
408	2448	NO. 3 HULL	419	2514
3959 GALS	23,754 LBS		3993 GALS	23,958 LBS

Below and at right, original P5M-1 APS-44 radar dish. (MFR)


CONFIDENTIAL
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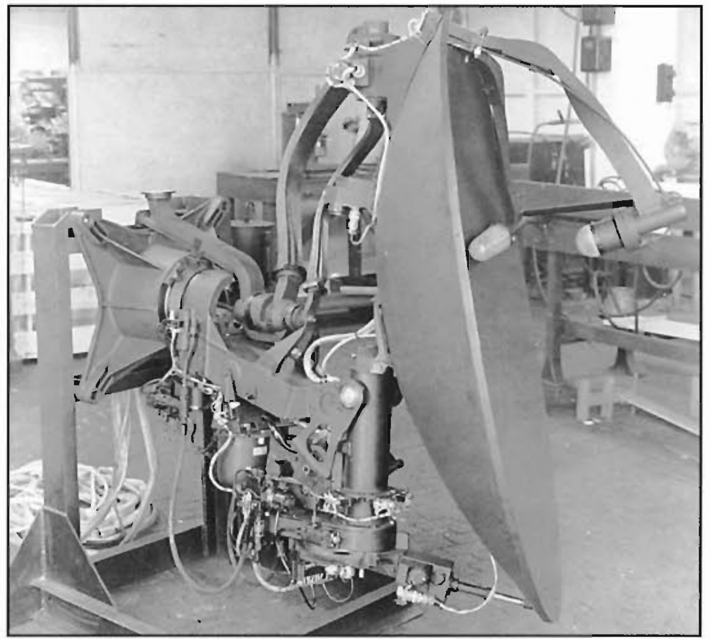
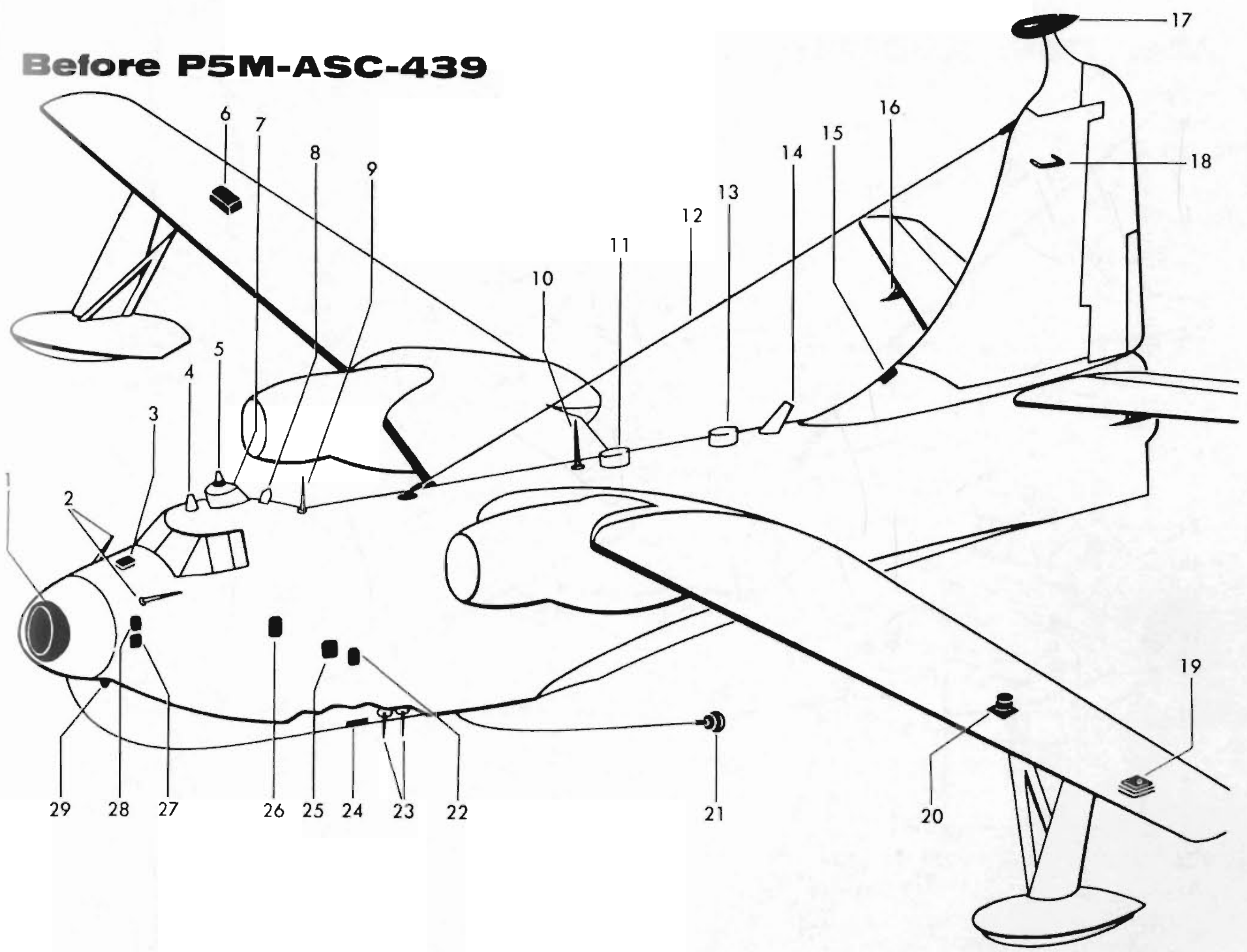


MARTIN P5M-1 ANTENNAS BEFORE ASC-439


Before P5M-ASC-439
1
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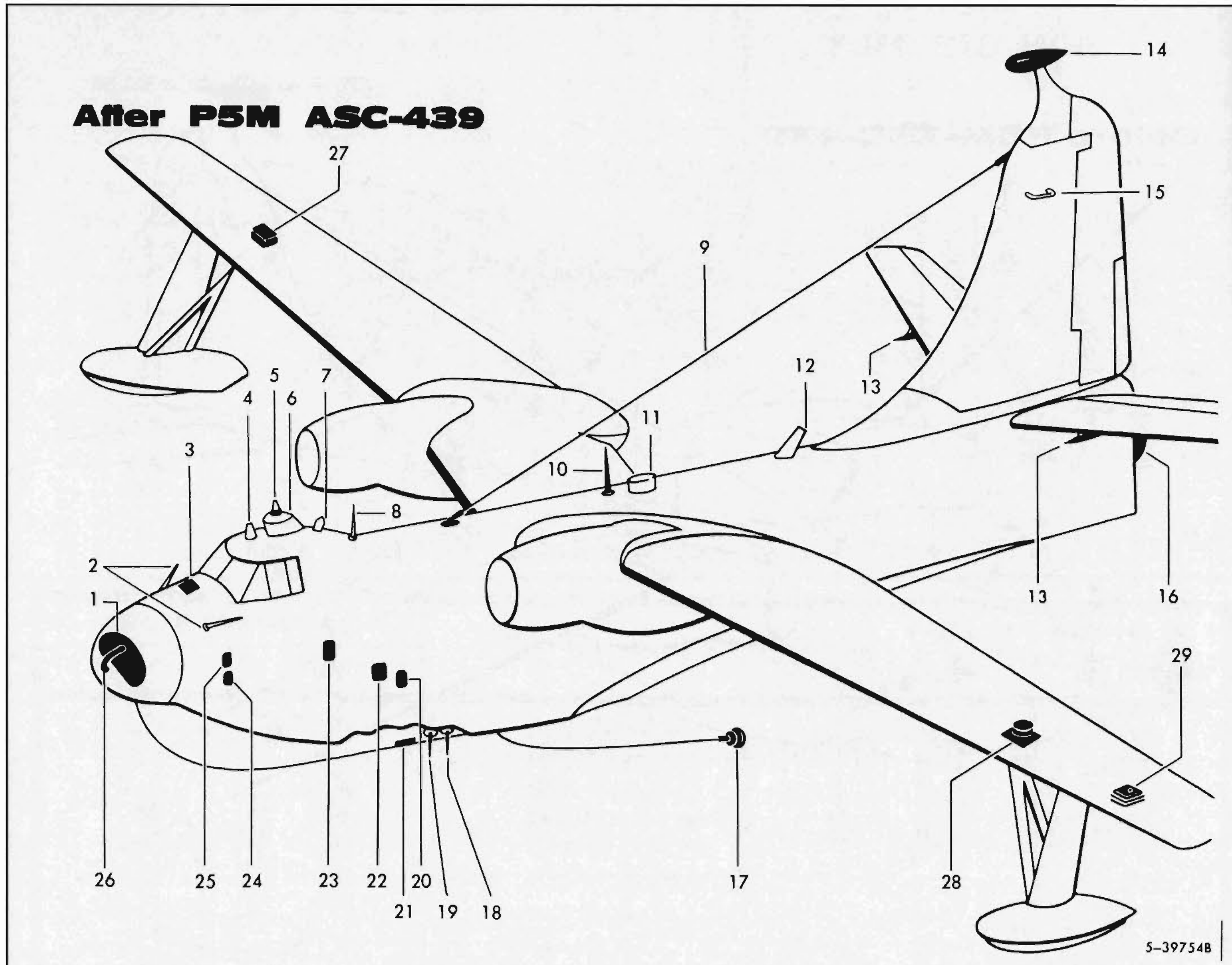
	ANTENNA	ASSOCIATED SYSTEM
1.	AS–562/APS–44	AN/APS–44
2.	AT–563/AP	AN/ALR–8
3.	AS–578/ARA–25	**AN/ARC–27 *AN/ARC–27A
4.	AT–141A/ARC	**AN/ARC–27 *AN/ARC–27A
5.	AS–133/APX–6	AN/APX–6
6.	R–88–T–1950–50 (compass transmitter)	G–2 COMPASS
7.	AS–434/APA–69	AN/APA–69A
8.	AT–500/AP	AN/ALR–8
9.	AT–8/AR	AN/ARC–1
10.	AT–563/ARN	AN/ARN–6 No. 2
11.	AS–313/ARN	AN/ARN–6 No. 2
12.	FIXED WIRE ANTENNA	AN/APN–4 AN/ARC–38 AN/ARR–41
13.	AS–313/ARN	AN/ARN–6 No. 1
14.	AT–121/AP	AN/ALR–8
15.	AT–563/ARN	AN/ARN–6 No. 1
16.	AT–4APN–1	AN/APN–1
17.	DT–37/ASQ–8	AN/ASQ–8
18.	AT–436/ARN–14	AN/ARN–14E
19.	AT–134A/ARN	AN/ARN–12
20.	R–88–T–1910–50 (compass transmitter)	FLUX GATE COMPASS
21.	TRAIL WIRE ANTENNA	AN/APN–4 AN/ARC–38 AN/ARC–41
22.	AT–302/APR–9 (port and starboard)	AN/ALR–8
23.	AT–446/ARR	AN/ARR–26
24.	E845012	AN/ARN–21
25.	AT–303/APR–9 (port and starboard)	AN/ALR–8
26.	AT–304/APR–9 (port and starboard)	AN/ALR–8
27.	AT–303/APR–9 (port and starboard)	AN/ALR–3
28.	AT–304/APR–9	AN/ALR–3
29.	AS–133/APX–7	AN/APX–7

*ON AIRPLANES 135452 THRU 135473
**ON AIRPLANES 124910 THRU 130306

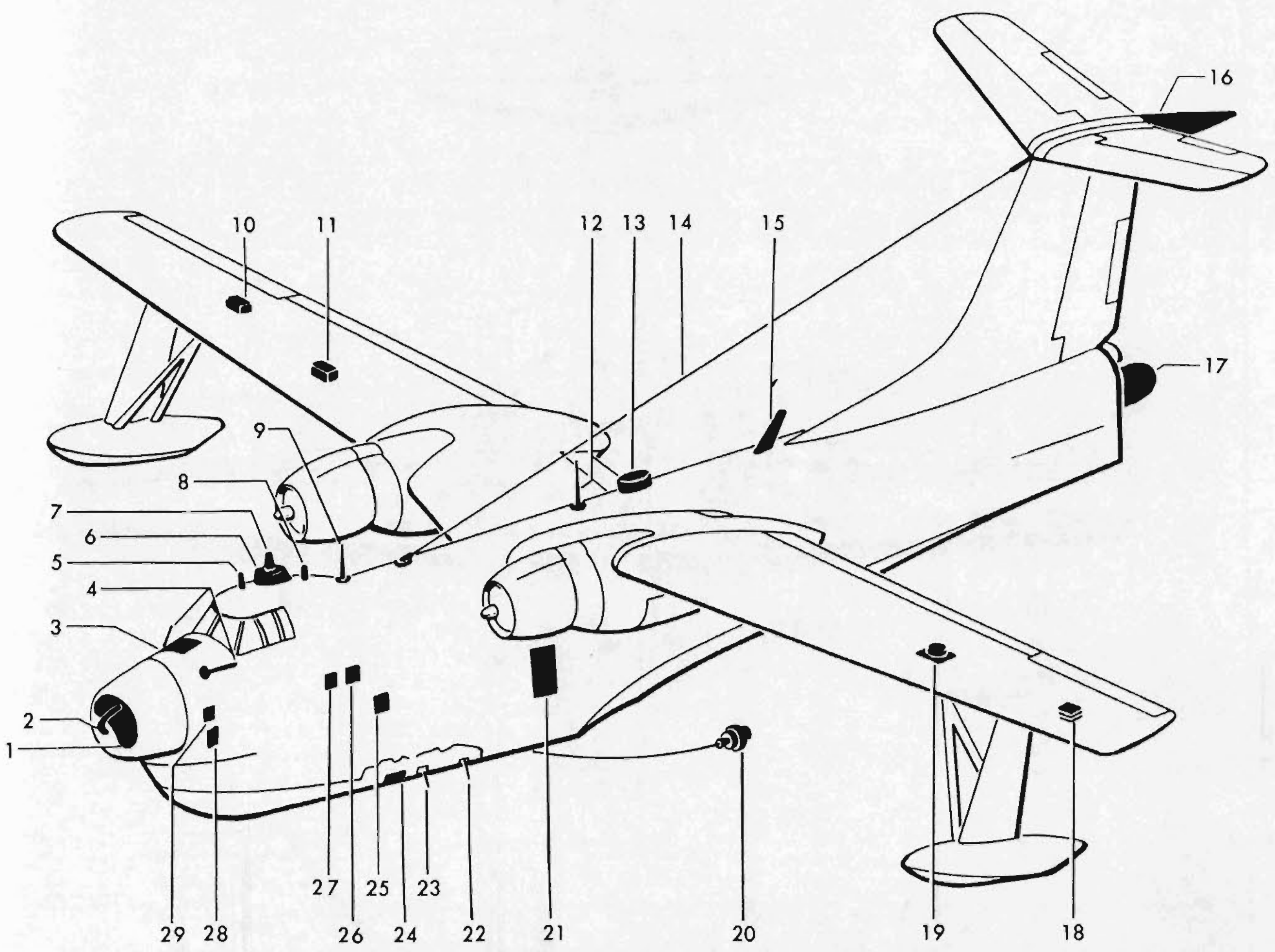
MARTIN P5M-1 ANTENNAS AFTER ASC-439



	ANTENNA	SYSTEM
1	AS-1000/APS-80	AN/APS-80
2	AT-563/AP	AN/ALR-8
3	AS-578/ARA-25	AN/ARC-27A AN/ARR-26 (receiver B)
4	AT-141A/ARC	AN/ARC-27A
5	AS-133/APX-6	AN/APX-6
6	AS-676/APA-69	AN/APA-69C
7	AT-500/AP	AN/ALR-8
8	AT-8/AR	AN/ARC-1
9	FIXED WIRE ANTENNA	AN/APN-4 AN/ARC-38 AN/ARR-41
10	AT-563/ARN	AN/ARN-6
11	AS-313/ARN	AN/ARN-6
12	AT-121/AP	AN/ALR-8
13	AT-4/APN-1	AN/APN-1
14	DT-37/ASQ-8	AN/ASQ-8
15	AT-436/ARN-14 (port & starboard)	AN/ARN-14A
16	RT-533/APN-122 (receiver transmitter)	AN/APN-122
17	TRAIL WIRE ANTENNA	AN/APN-4 AN/ARC-38 AN/ARR-41

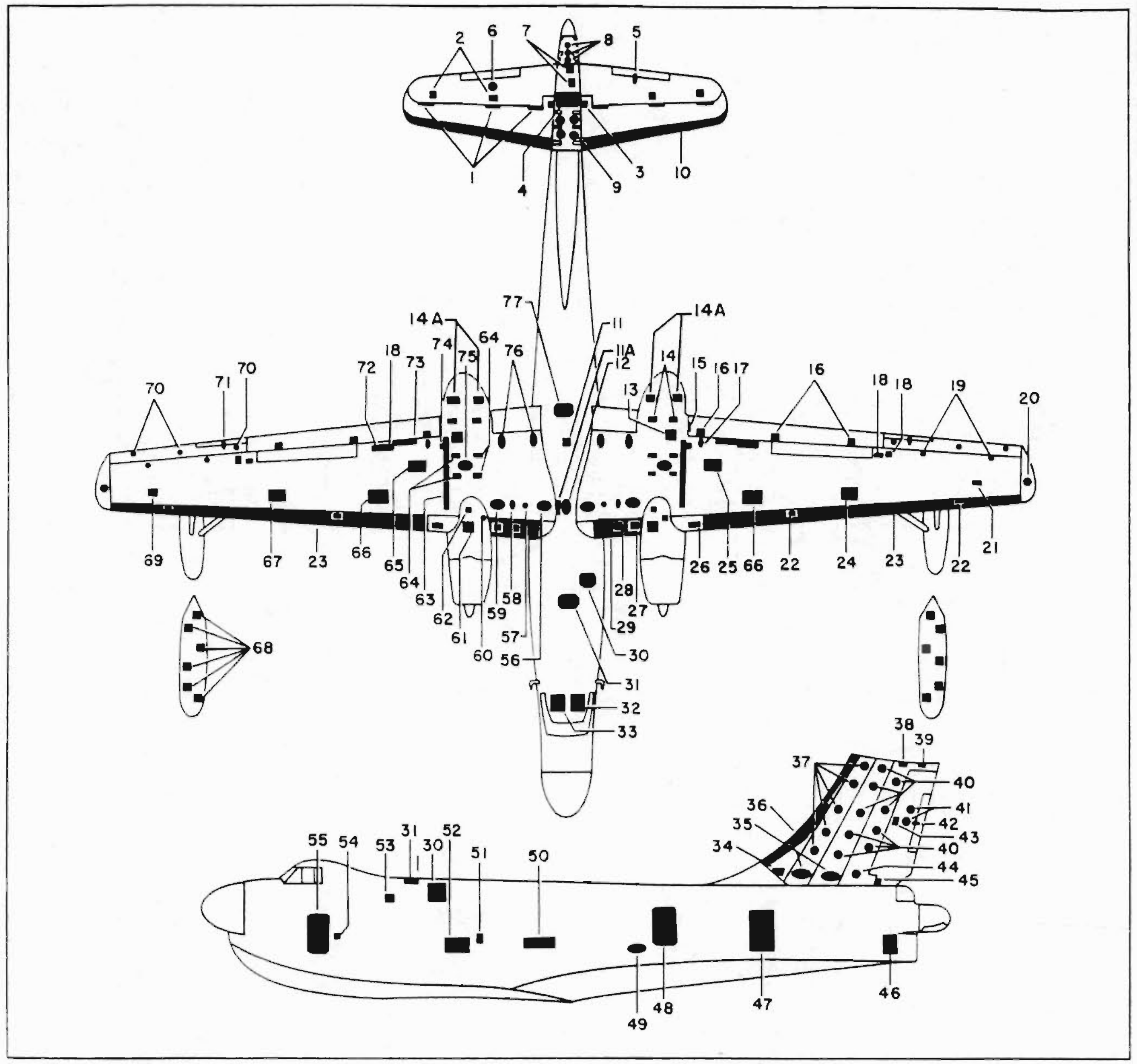
	ANTENNA	SYSTEM
18	AT-446/ARR	AN/ARR-26 (receiver A & B) AN/ARR-58 (receiver A & C)
19	AT-466/ARR	AN/ARR-58 (receiver B & D)
20	AT-302/APR-9 (port & starboard)	AN/ALR-8
21	E845012 (port & starboard)	AN/ARN-21
22	AT-303/APR-9 (port & starboard)	AN/ALR-8
23	AT-304/APR-9 (port & starboard)	AN/ALR-8
24	AT-303/APR-9 (port & starboard)	AN/ALR-3
25	AT-304/APR-9 (port & starboard)	AN/ALR-3
26	AN/APX-7 (integral part of AS-1000/APS-80)	AN/APX-7
27	R-88-T-1950-50 (compass transmitter)	G-2 COMPASS
28	KJ-4 (compass transmitter)	MF-1 COMPASS
29	AT-134A/ARN	AN/ARN-12

MARTIN P5M-2 ANTENNAS AFTER ASC-439

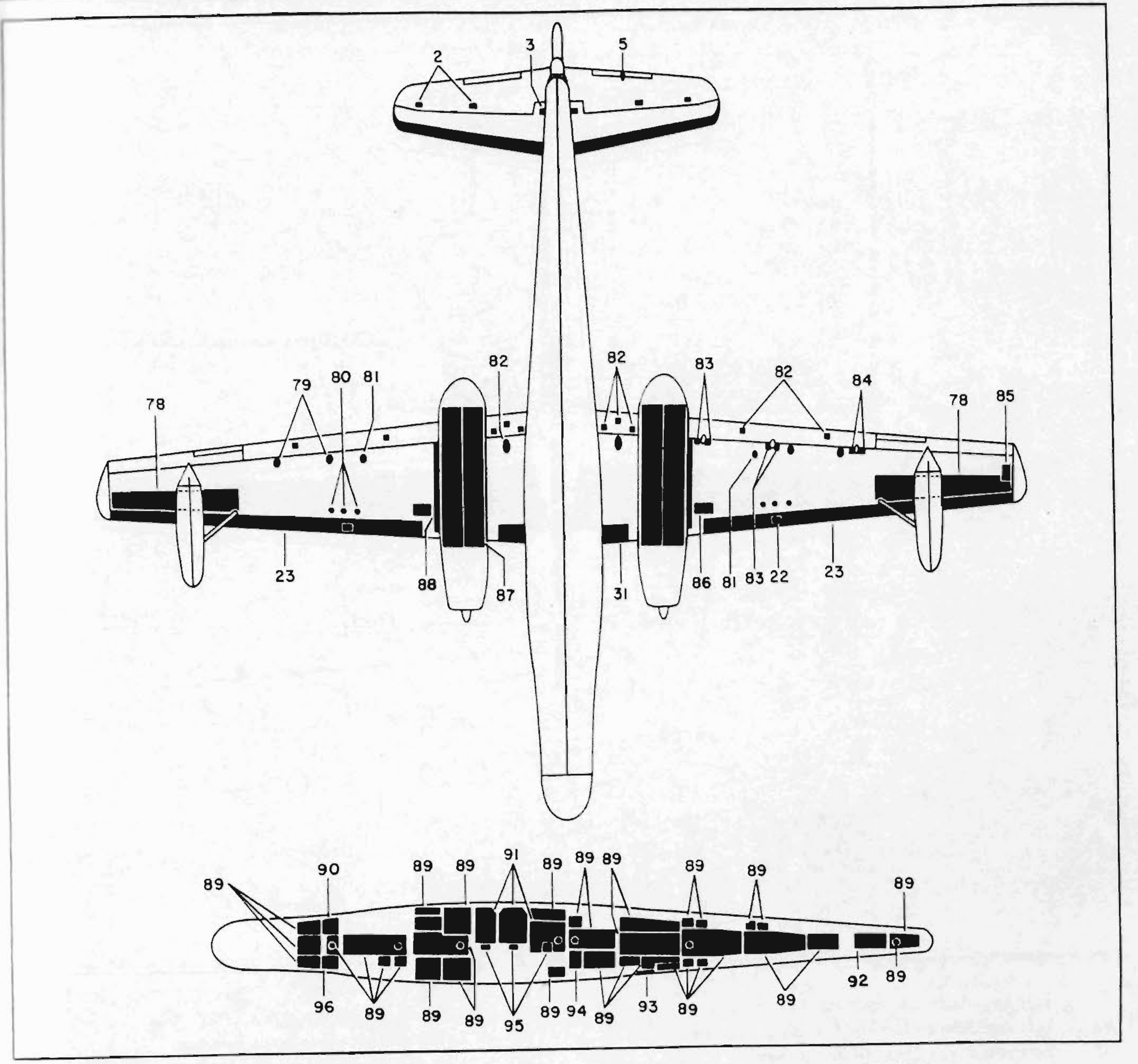


ANTENNA	ASSOCIATED SYSTEM
1. AS-1000/APS-80	AN/APS-80
2. AN/APX-7 (integral part of AS-1000/APS-80)	AN/APX-7
3. AS-578/ARA-25	AN/ARC-27A AN/ARR-26 (receiver B)
4. AT-563/AP	AN/ALR-8
5. AT-141A/ARC	AN/ARC-27A
6. AS-676/APA-69	AN/APA-69C
7. AS-133/APX-6	AN/APX-6
8. AT-500/AP	AN/ALR-8
9. AT-8/AR	AN/ARC-1
10. R-88-T-1950-50 (compass transmitter)	G2 COMPASS
11. RT-160/APN-22	AN/APN-22
12. AT-563/ARN	AN/ARN-6
13. AS-313/ARN	AN/ARN-6
14. FIXED WIRE ANTENNA	AN/APN-4 AN/ARC-38 AN/ARR-41
15. AT-121/AP	AN/ALR-8
16. DT-37/ASQ-8	AN/ASQ-8
17. RT-533/APN-122 (receiver-transmitter)	AN/APN-122

ANTENNA	ASSOCIATED SYSTEM
18. AT-134A/ARN	AN/ARN-12
19. KJ-4 (compass transmitter)	MF-1 COMPASS
20. TRAILING WIRE ANTENNA	AN/APN-4 AN/ARC-38 AN/ARR-41
21. AT-495/ARN-14 (port and starboard)	AN/ARN-14E
22. AT-466/ARR	AN/ARR-26 AN/ARR-58 (receiver A and C)
23. AT-466/ARR	AN/ARR-58 (receiver B and D)
24. E-845012	AN/ARN-21
25. AT-302/APR-9 (port and starboard)	AN/ALR-8
26. AT-303/APR-9 (port and starboard)	AN/ALR-8
27. AT-304/APR-9 (port and starboard)	AN/ALR-8
28. AT-303/APR-9 (port and starboard)	AN/ALR-3
29. AT-304/APR-9 (port and starboard)	AN/ALR-3

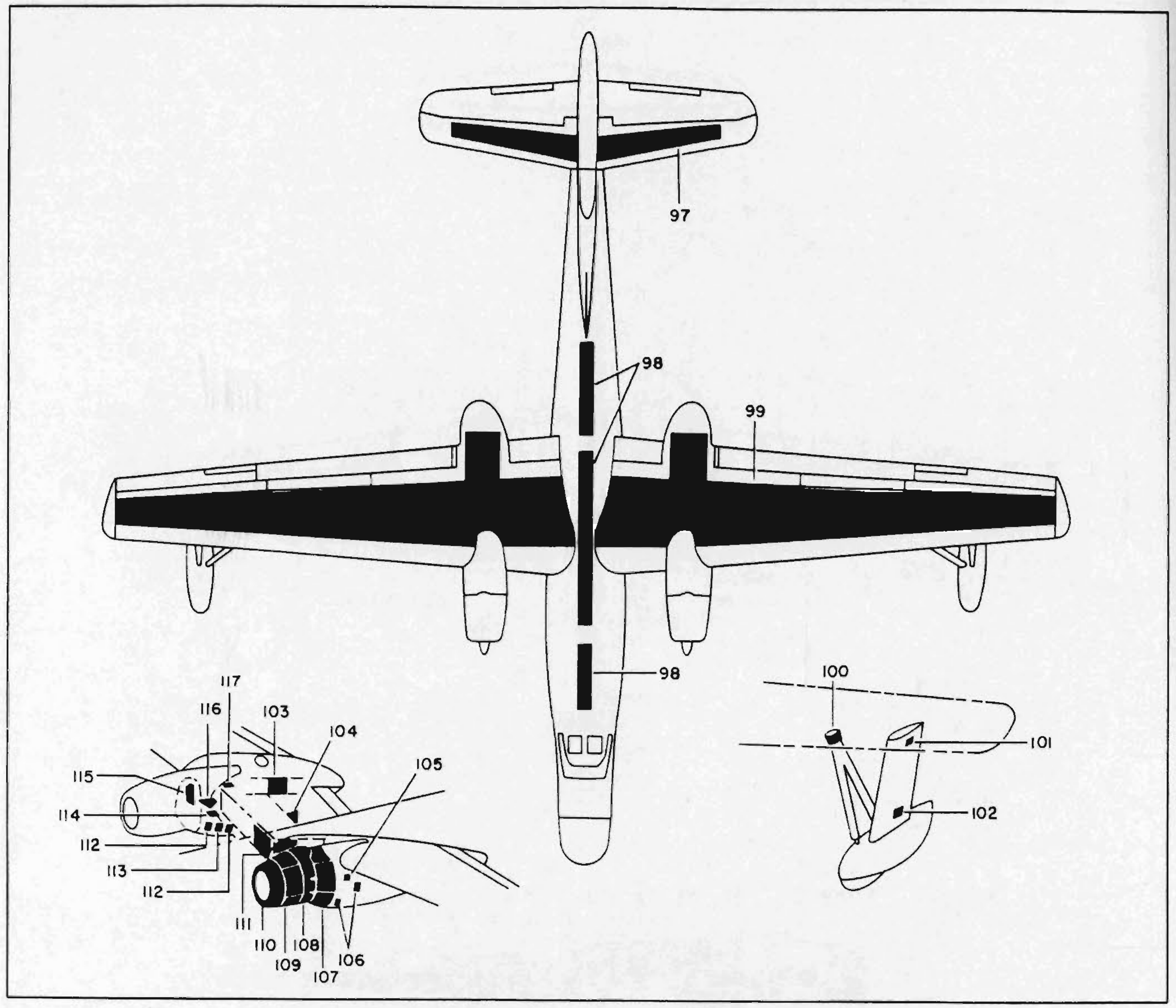


1	Left and Right Stabilizer Cover Skins
2	Left and Right Elevator Hinges
3	Left and Right Elevator Torque Tubes
4	Elevator Bellcrank and Surface Control Lock
5	Elevator Tab Push-Pull Rod
6	Elevator Tab Rod Inspection Door
7	Detecting Head Lock and Mechanism Handles
8	Detecting Head Components
9	Stabilizer Fitting
10	Left and Right Removable Leading Edges
11	Aft Hoist Fitting
11A	ADI Tank Filler
12	Forward Hoist Fitting
13	Left and Right Flap Cylinders
14	Left and Right Stores Static Lines
14A	Beaver Tail Inspection Doors
15	Left and Right Flap Inspection
16	Left and Right Flap Hinges
17	Left and Right Outer Wing Controls Splices
18	Left and Right Controls Inspection
19	Left and Right Aileron Hinges
20	Left and Right Wing Tip Wiring
21	Marker Beacon, Left Side
22	Left and Right Deicer Hoses
23	Left and Right Removable Outer Wing Leading Edges
24	Fluxgate Compass, Left Side
25	Oil Cooler, Left Side
26	Left and Right Outer Wing Disconnect
27	Left and Right Leading Edges Inspection
28	Left and Right Engine Controls Inspection
29	Left and Right Removable Center Wing Leading Edges
30	Flight Deck Escape Hatch
31	Periscopic Sextant Hatch
32	Pilot's Escape Hatch
33	Copilot's Escape Hatch
34	Left and Right Fin Wiring
35	Left and Right Fin Attachment Bolts
36	Removable Fin Leading Edge
37	Fin Wiring and Deicer Lines
38	Elevator Walking Beam Left Side
39	Rudder Hinge, Left Side
40	Surface Controls, Left Side
41	Left and Right Rudder Tab Rod Inspection Door



42	Rudder Tab Push-Pull Rod, Left Side
43	Rudder Hinge Fitting, Left and Right Sides
44	Fin Attachment Fitting and Modification Plate, Left Side
45	Rudder Torque Tube Disconnect, Left and Right Side
46	Tail Beaching Gear Hatch, Right Side
47	Rear Entrance Hatch, Right Side
48	Rear Entrance Hatch, Left Side
49	Marine Marker Retroejector, Right Side
50	Sonobuoy Dispenser, Right Side
51	Fuel Filler, Left Side
52	Left and Right Main Beaching Gear Hatches
53	Driftmeter, Left Side
54	Anchor Light
55	Left and Right Forward Entrance Hatches
56	Left and Right Service Tanks
57	Left and Right Auxiliary Wing Tank Capacitors
58	Left and Right Auxiliary Wing Tank Fillers
59	Left and Right Auxiliary Wing Tanks
60	Left and Right Engine Hoists
61	Upper Nacelle
62	Left and Right Oil Tank Fillers
63	Left and Right Wing Splice Bolt Fairing
64	Left and Right Bomb Hoist Fitting Holes
65	Oil Cooler and Main Engine Fire Extinguishing Containers, Right Side
66	Left and Right External Stores
67	G-2 Compass Transmitter, Right Side
68	Left and Right Float Inspection
69	Equipment Recess, Right Side
70	Left and Right Aileron Inspection
71	Left and Right Aileron Tab Push Pull Rods
72	Left and Right Spoiler Accumulator Pressure Gages and Air Filler Valves
73	Left and Right Oil Cooler Exits
74	Left and Right Wing Splices
75	Left and Right Bomb Hoists
76	Left and Right Wing Trailing Edge Inspection
77	APU Hatch
78	Inspection Panel
79	Left and Right Spoiler Aileron Rods
80	Left and Right External Stores Carrier Plugs

ACCESS AND INSPECTION DOORS P5M-2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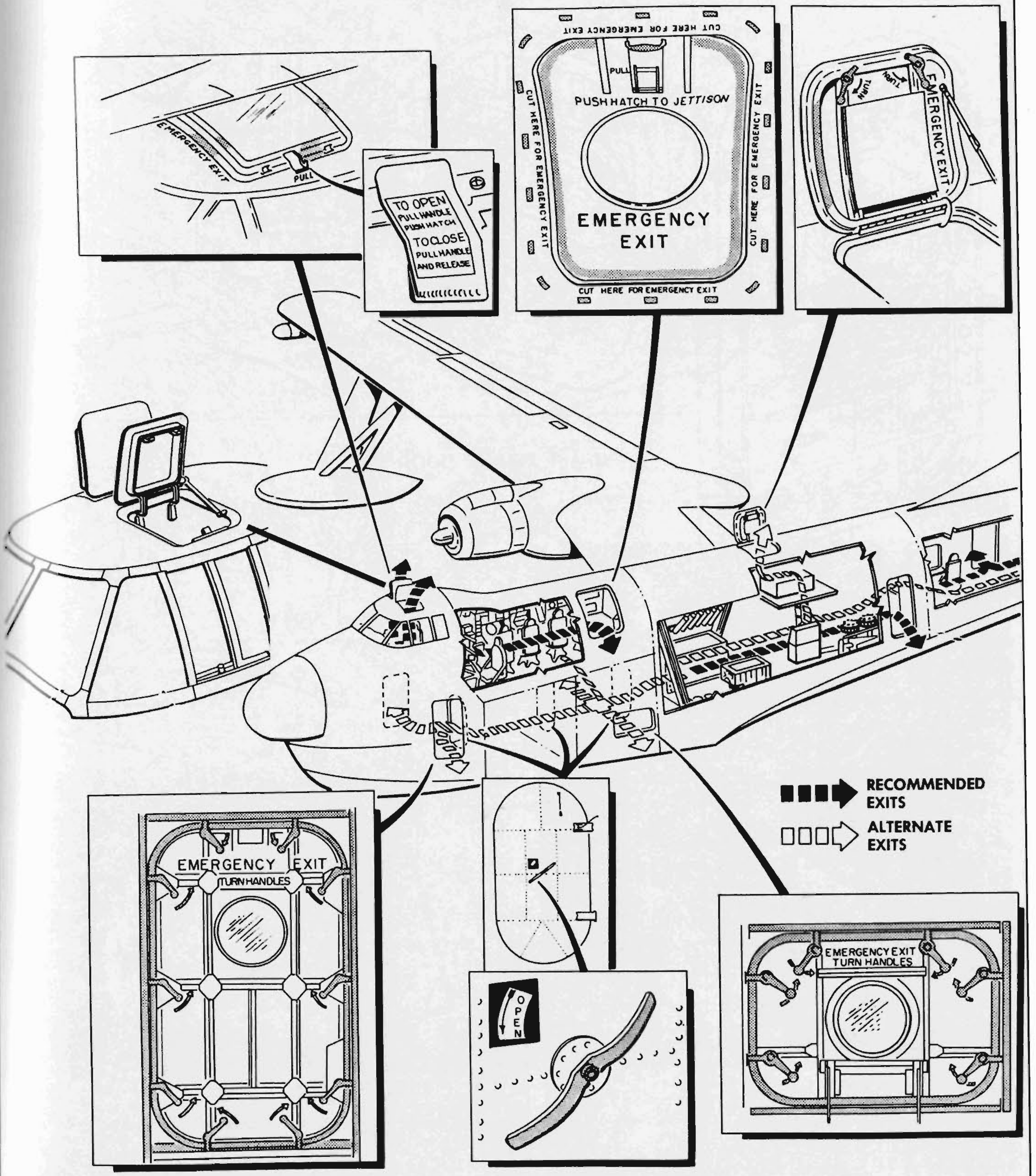
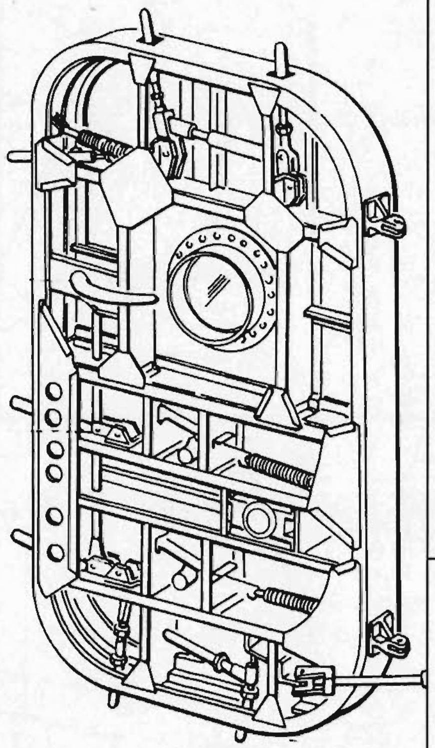
81	Left and Right Stores Static Line Fittings
82	Left and Right Flap and Trailing Edge Inspection
83	Left and Right Flap Hinge Fittings
84	Left and Right Spoiler Actuator Adjustment and Hinge Fittings
85	Searchlight Disconnect
86	Left and Right Outer Wing Splices
87	Left and Right Bomb Bay Doors
88	Left and Right Outer Wing Splice Fillets
89	Bilge
90	Battery Stowage
91	Tank Cover
92	Corrugated Panel
93	Dust Retainer
94	Hydraulic Panel
95	Fuel Tank
96	Anchor Rope Locker
97	Left and Right Stabilizer Walkway
98	Hull Crown Walkway
99	Left and Right Wing Walkway
100	Left and Right Side Strut Fairings
101	Left and Right Strut Inspection
102	Left and Right Float Vent Tubes
103	Left and Right Auxiliary Wing Tank
104	Left and Right Fuel Booster Pump
105	Fuel and Oil Line Fittings
106	Left and Right Fitting Inspection
107	Left and Right Accessory Cowling
108	Left and Right Cowl Flaps
109	Left and Right Cowl Panels
110	Left and Right Cowl Noses
111	Left and Right Service Tanks
112	Left and Right Engine Bearer Fitting Inspection
113	Left and Right Oil System Drains
114	Left and Right Constant Speed Drives
115	Left and Right Firewalls
116	Left and Right Lower Nacelles
117	A-C Generator Access Door

P5M HATCHES

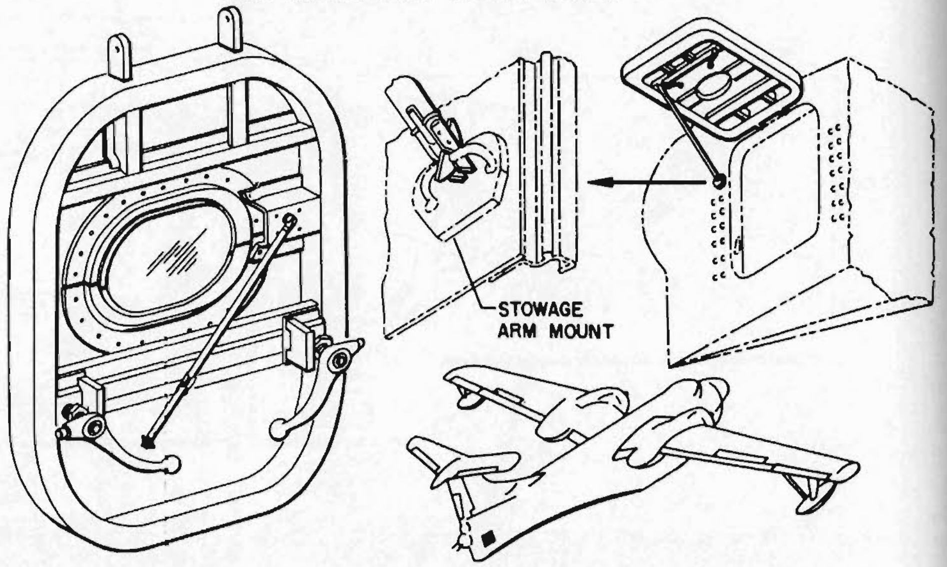

EMERGENCY EXIT
PULL
TO OPEN PULL HANDLE PUSH HATCH
TO CLOSE PULL HANDLE AND RELEASE
CUT HERE FOR EMERGENCY EXIT
PULL
PUSH HATCH TO JETTISON
CUT HERE FOR EMERGENCY EXIT
CUT HERE FOR EMERGENCY EXIT
EMERGENCY EXIT
CUT HERE FOR EMERGENCY EXIT
TURN
TURN
EMERGENCY EXIT
RECOMMENDED EXITS
ALTERNATE EXITS
EMERGENCY EXIT
TURN HANDLES
OPEN
EMERGENCY EXIT TURN HANDLES

P5M HATCHES AND DOORS

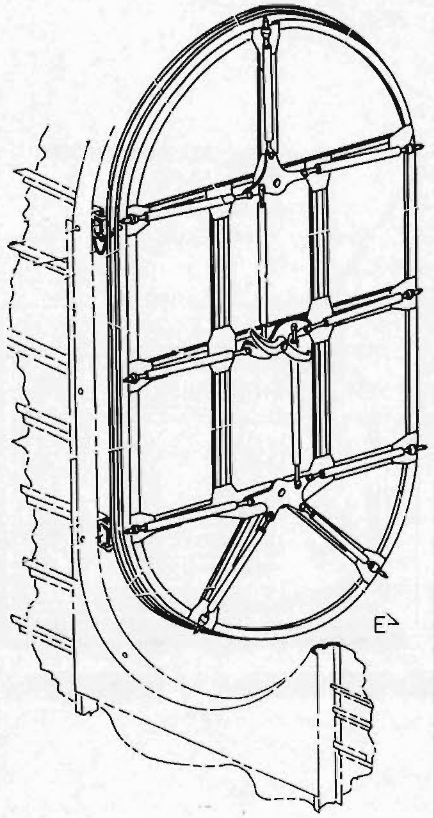
WAIST HATCH



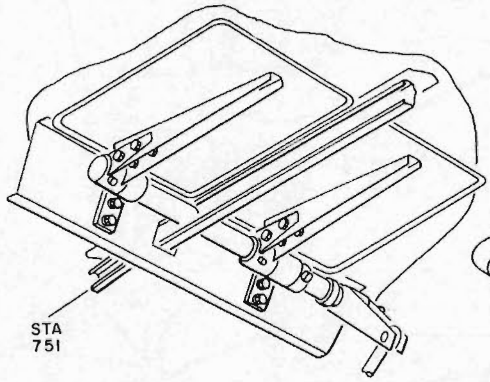
TAIL BEACHING GEAR HATCH


STOWAGE
ARM MOUNT

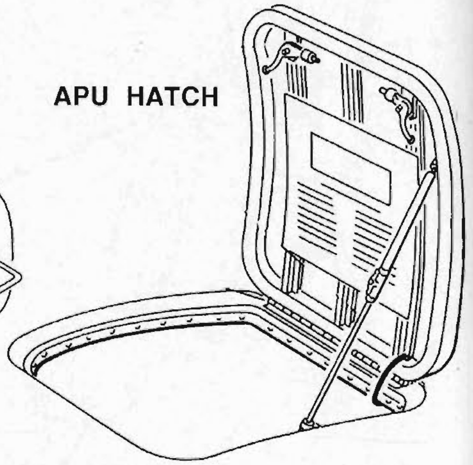
WATERTIGHT BULKHEAD DOOR

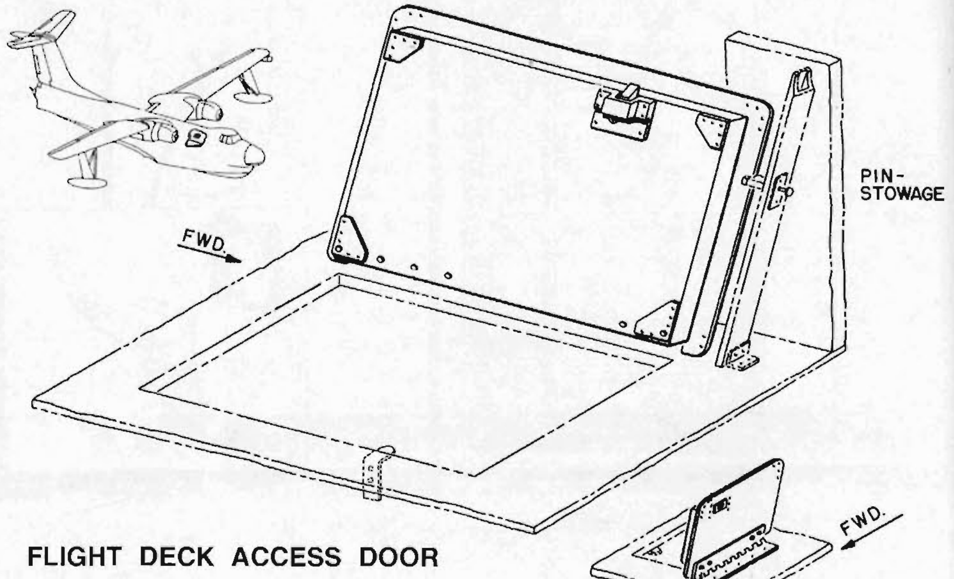


APU AIR INTAKE DOOR



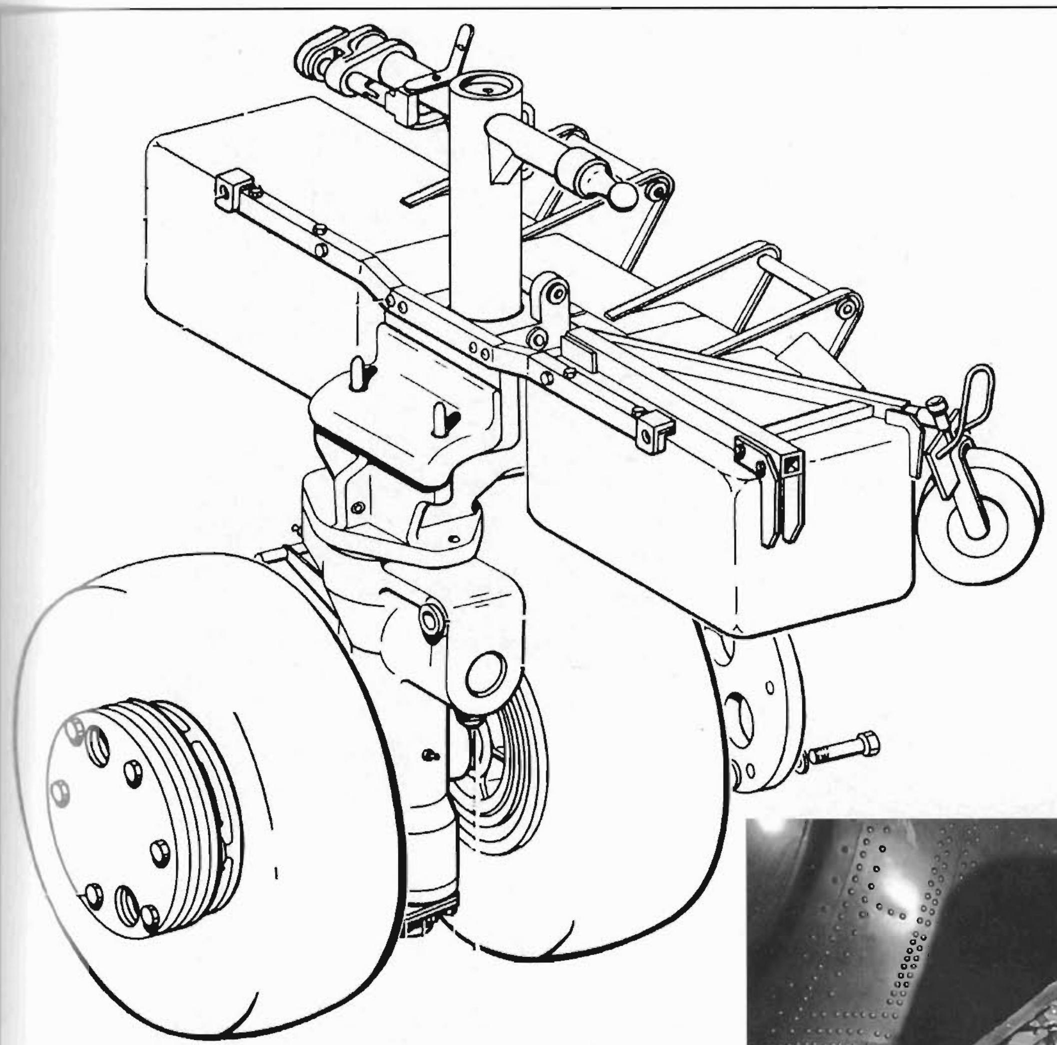
APU HATCH

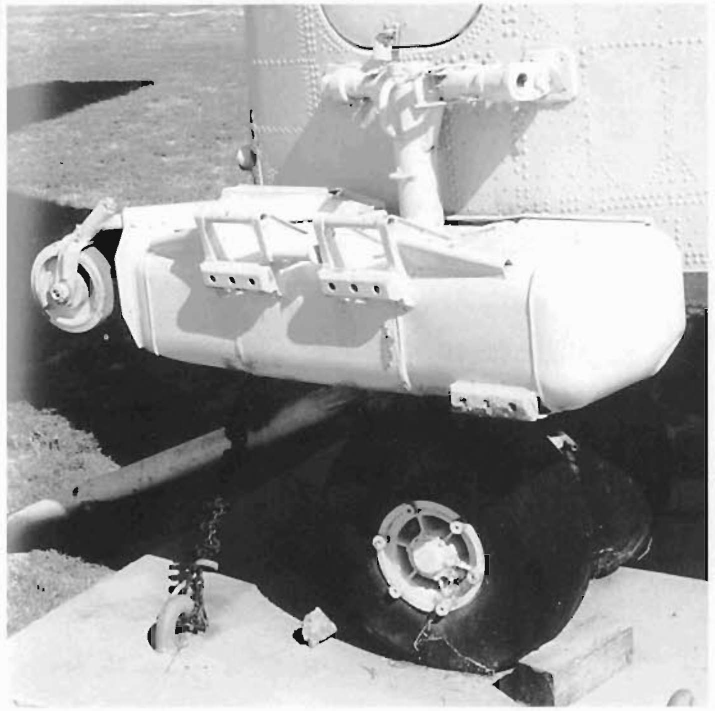



FWD.
PIN-
STOWAGE
FWD.

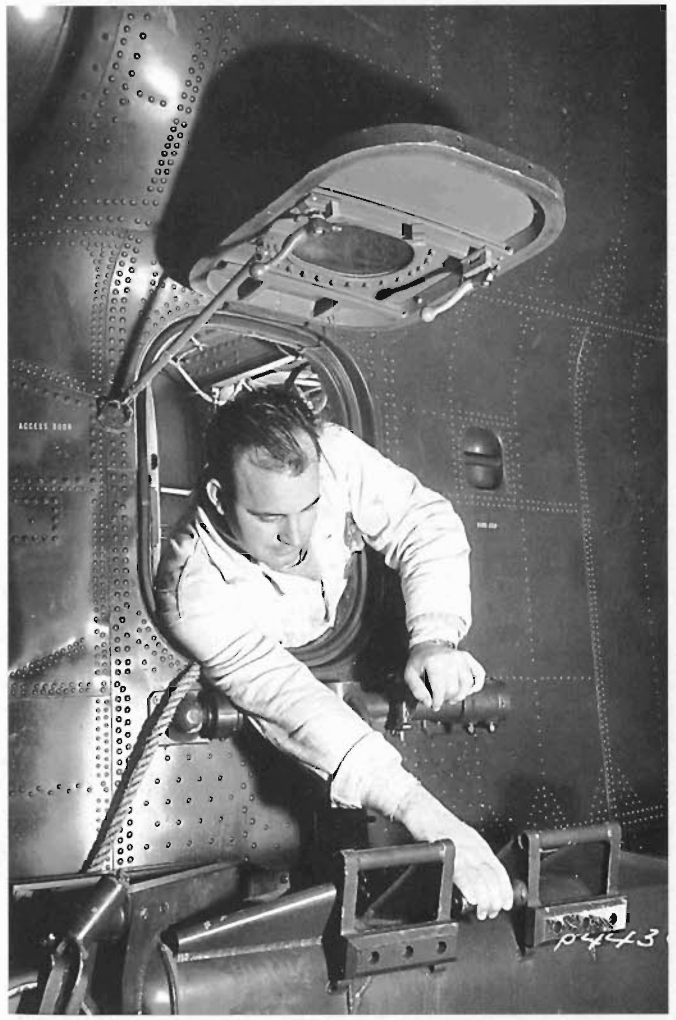
FLIGHT DECK ACCESS DOOR

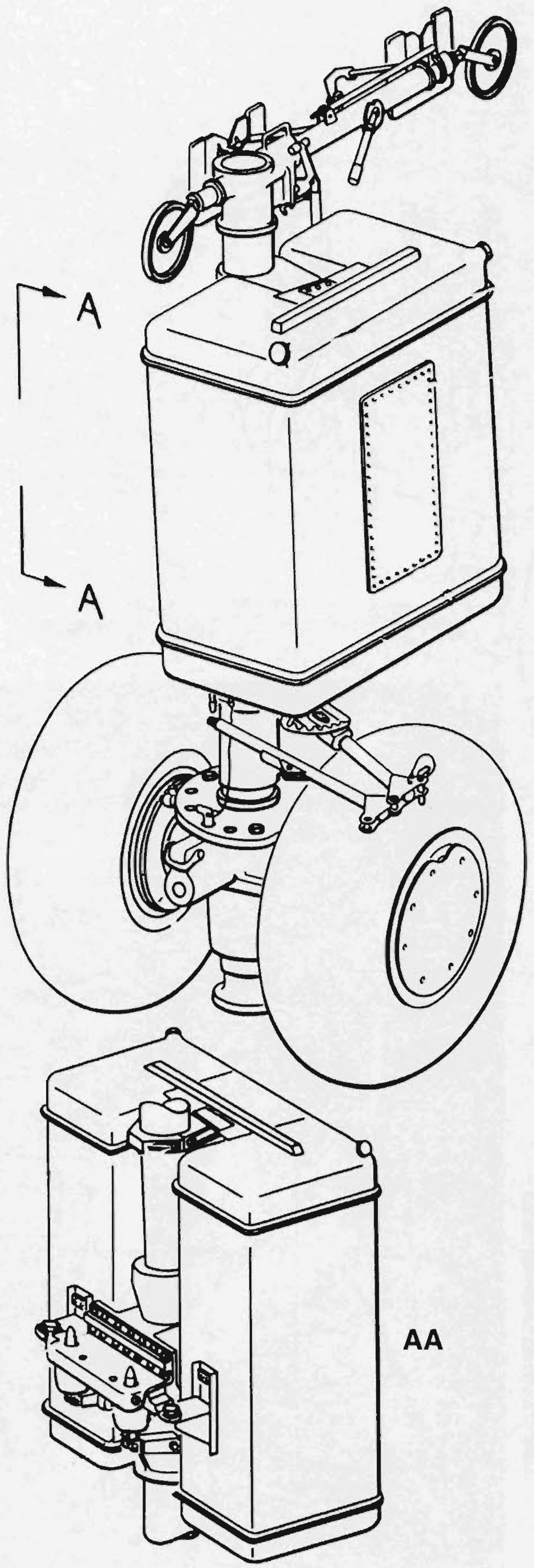
TAIL BEACHING GEAR





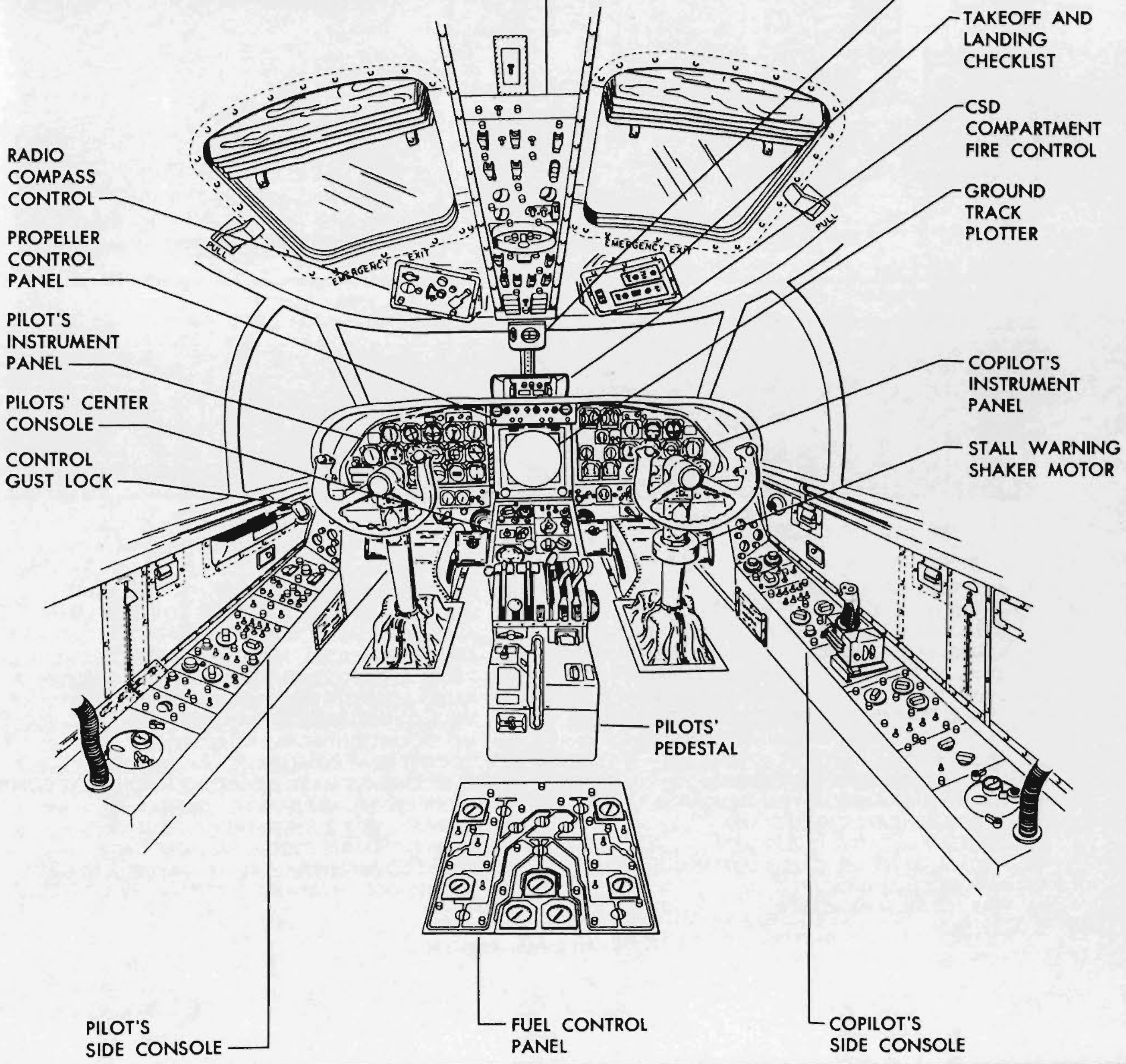
Beaching gear hatch. (Martin)


ACCESS DOOR
p443



Above, main beaching gear left side. (Martin)

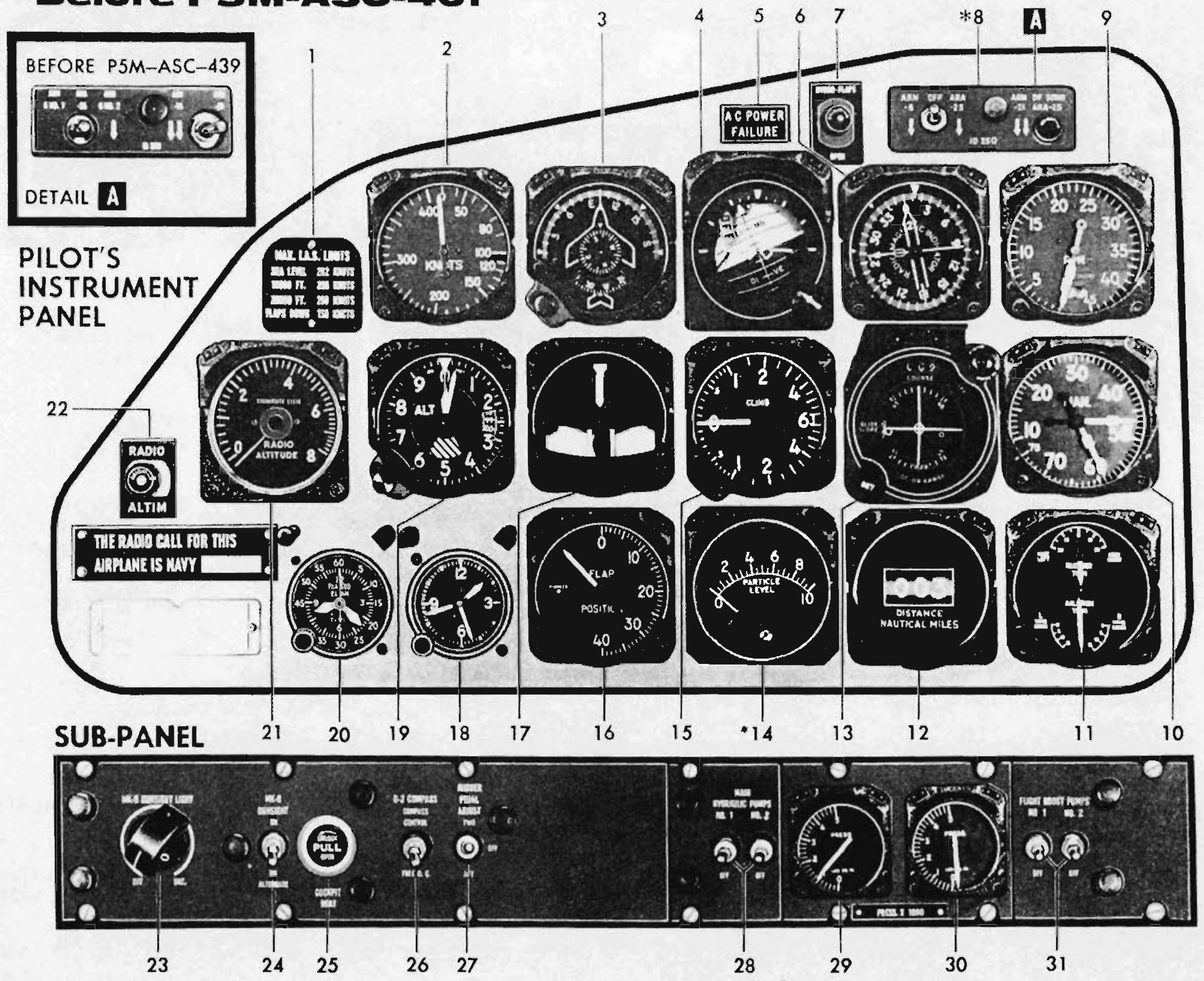
Below, main beaching gear right side. (Martin)


COCKPIT OVERHEAD PANEL
STANDBY COMPASS
TAKEOFF AND LANDING CHECKLIST
CSD COMPARTMENT FIRE CONTROL
GROUND TRACK PLOTTER
RADIO COMPASS CONTROL
PROPELLER CONTROL PANEL
PILOT'S INSTRUMENT PANEL
PILOTS' CENTER CONSOLE
CONTROL GUST LOCK
COPILOT'S INSTRUMENT PANEL
STALL WARNING SHAKER MOTOR
PILOTS' PEDESTAL
PILOT'S SIDE CONSOLE
FUEL CONTROL PANEL
COPILOT'S SIDE CONSOLE
EMERGENCY EXIT
PULL

PILOT'S INSTRUMENT PANEL BEFORE P5M-ASC-461

PILOTS' INSTRUMENT PANELS

Before P5M-ASC-461

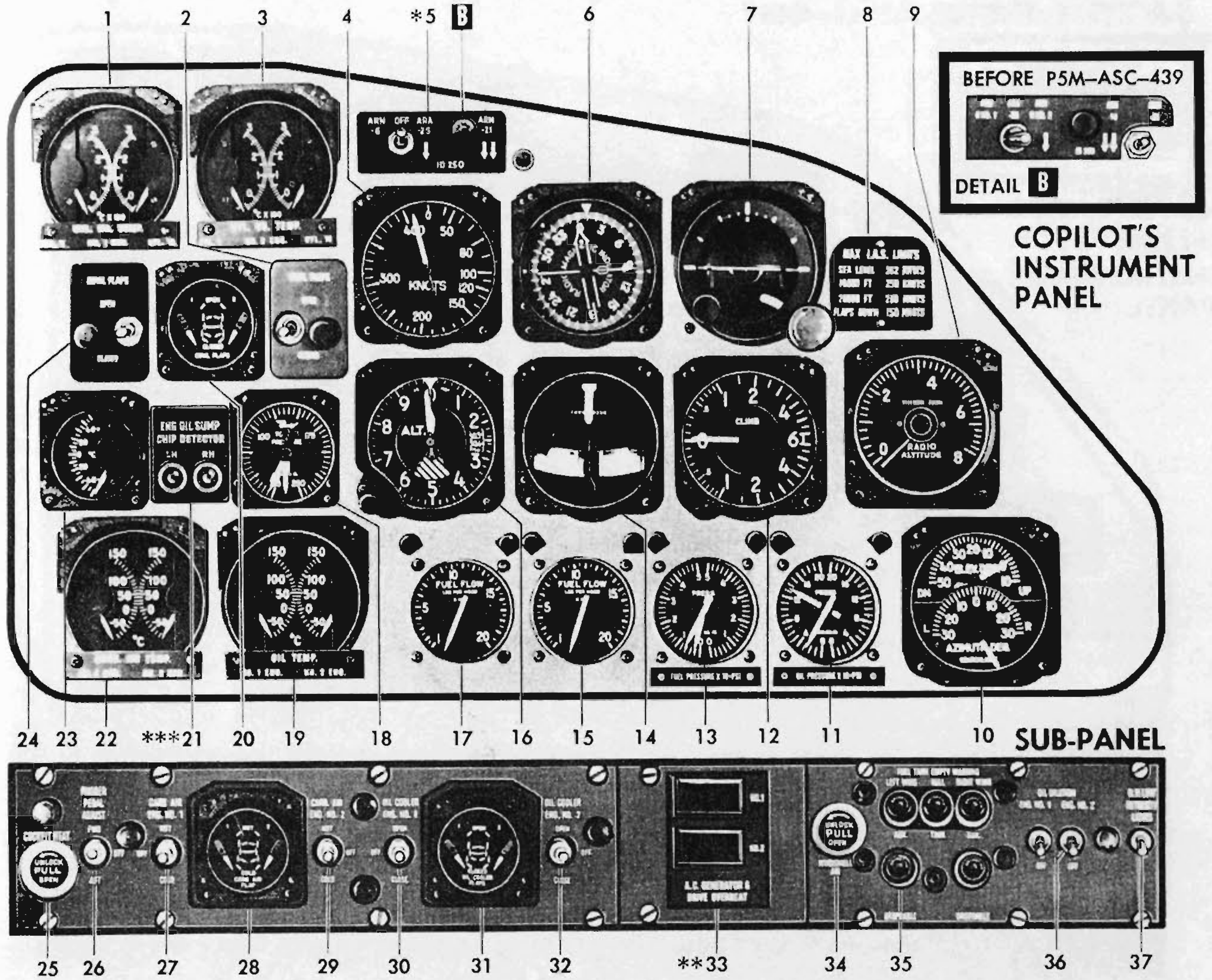


BEFORE P5M-ASC-439
DETAIL A
PILOT'S INSTRUMENT PANEL
SUB-PANEL
AC POWER FAILURE
THE RADIO CALL FOR THIS AIRPLANE IS NAVY
RADIO ALTIM
1 2 3 4 5 6 7 *8 A 9
22
21 20 19 18 17 16 15 *14 13 12 11 10
23 24 25 26 27 28 29 30 31

1. AIRSPEED LIMIT PLACARD
2. AIRSPEED INDICATOR
3. G-2 COMPASS MASTER DIRECTION INDICATOR
4. VERTICAL GYRO INDICATOR
5. AC BUS POWER FAILURE INDICATOR LIGHT
6. RADIO MAGNETIC INDICATOR ID-250/ARN
7. HYDRO-FLAP OPEN INDICATOR LIGHT
*8. RADIO SELECTOR FOR RMI ID-250/ARN
9. TACHOMETER
10. MANIFOLD PRESSURE INDICATOR
11. RUDDER AND AILERON TRIM INDICATOR
12. RANGE INDICATOR ID-310/ARN
13. COURSE INDICATOR ID-249/ARN
14. PARTICAL LEVEL INDICATOR (AN/ASR-3)
15. RATE-OF-CLIMB INDICATOR
16. FLAP POSITION INDICATOR
17. TURN AND BANK INDICATOR
18. EIGHT DAY CLOCK
19. ALTIMETER
20. ELAPSE TIME CLOCK
21. RADIO ALTIMETER (AN/APN-1)
22. RADIO ALTIMETER LIMIT INDICATOR LIGHT
23. MK-8 GUNSIGHT LIGHT RHEOSTAT
24. MK-8 GUNSIGHT FILAMENT SELECTOR
25. COCKPIT HEAT CONTROL
26. G-2 COMPASS MASTER DIRECTION INDICATOR CONTROL
27. RUDDER PEDAL ADJUSTMENT CONTROL
28. MAIN HYDRAULIC SYSTEM PUMP CONTROLS
29. MAIN HYDRAULIC SYSTEM PRESSURE GAGE
30. FLIGHT BOOST HYDRAULIC SYSTEM PRESSURE GAGE
31. FLIGHT BOOST HYDRAULIC SYSTEM PUMP CONTROLS

*AFTER P5M-ASC-439

COPILOT'S INSTRUMENT PANEL BEFORE P5M-ASC-461



BEFORE P5M-ASC-439
DETAIL B
COPILOT'S INSTRUMENT PANEL
SUB-PANEL
1 2 3 4 *5 B 6 7 8 9
24 23 22 ***21 20 19 18 17 16 15 14 13 12 11 10
25 26 27 28 29 30 31 32 **33 34 35 36 37

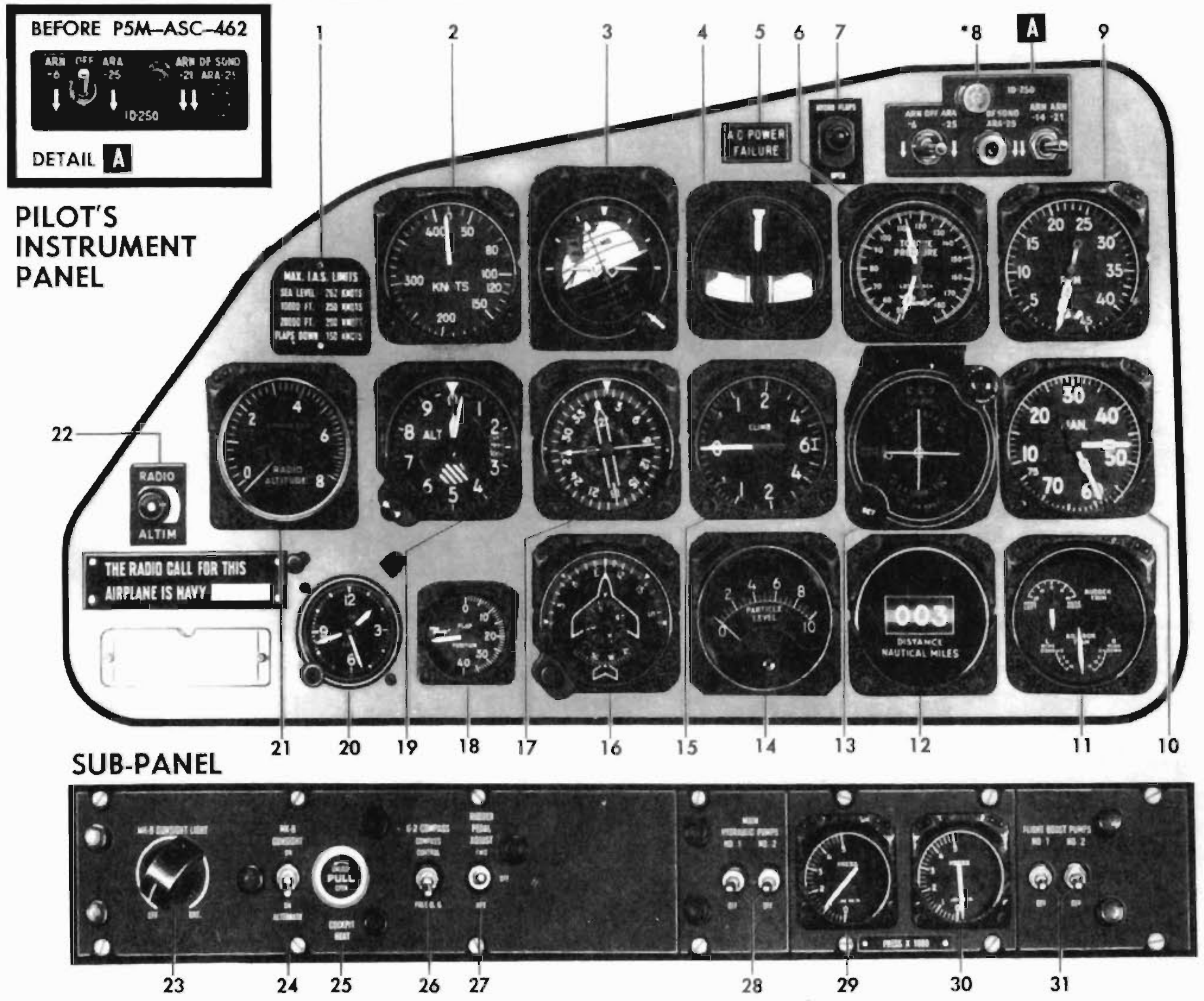
1. CYL HEAD TEMPERATURE GAGE NO. 1 ENGINE
2. COWL FLAP CONTROL NO. 2 ENGINE
3. CYL HEAD TEMPERATURE GAGE NO. 2 ENGINE
4. AIRSPEED INDICATOR
*5. RADIO SELECTOR PANEL FOR RMI ID-250/ARN
6. RADIO MAGNETIC INDICATOR ID-250/ARN
7. GYRO HORIZON INDICATOR
8. AIRSPEED LIMIT PLACARD
9. RADIO ALTIMETER (AN/APN-1)
10. SEARCH LIGHT POSITION INDICATOR
11. OIL PRESSURE GAGE
12. RATE-OF-CLIMB INDICATOR
13. FUEL PRESSURE GAGE
14. TURN AND BANK INDICATOR
15. FUEL FLOW INDICATOR NO. 1 ENGINE
16. ALTIMETER
17. FUEL FLOW INDICATOR NO. 2 ENGINE
18. TORQUE PRESSURE GAGE
19. OIL TEMPERATURE GAGE
20. COWL FLAP POSITION INDICATOR
***21. ENGINE OIL SUMP CHIP DETECTOR
22. CARBURETOR AIR TEMPERATURE GAGE
23. OUTSIDE AIR TEMPERATURE GAGE
24. COWL FLAP CONTROL NO. 1 ENGINE
25. COCKPIT HEAT CONTROL
26. RUDDER PEDAL ADJUSTMENT CONTROL
27. CARBURETOR AIR FLAP CONTROL NO. 1 ENGINE
28. CARBURETOR AIR FLAP POSITION INDICATOR
29. CARBURETOR AIR FLAP CONTROL NO. 2 ENGINE
30. OIL COOLER FLAP CONTROL NO. 1 ENGINE
31. OIL COOLER FLAP POSITION INDICATOR
32. OIL COOLER FLAP CONTROL NO. 2 ENGINE
**33. AC GENERATOR AND DRIVE OVERHEAT INDICATOR
34. COPILOT'S WINDSHIELD AIR CONTROL
35. FUEL TANK EMPTY WARNING LIGHTS
36. OIL DILUTION CONTROLS
37. COPILOT'S LOW INTENSITY LIGHT CONTROL

*AFTER P5M-ASC-439
**RELOCATED FROM CENTER INSTRUMENT PANEL TO SUB-PANEL BY P5M-ASC-439
***AFTER P5M-ASC-455

5-18000F

PILOTS' INSTRUMENT PANELS

AFTER P5M-ASC-461


BEFORE P5M–ASC–462
DETAIL A
PILOT'S INSTRUMENT PANEL
SUB-PANEL
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*8 A
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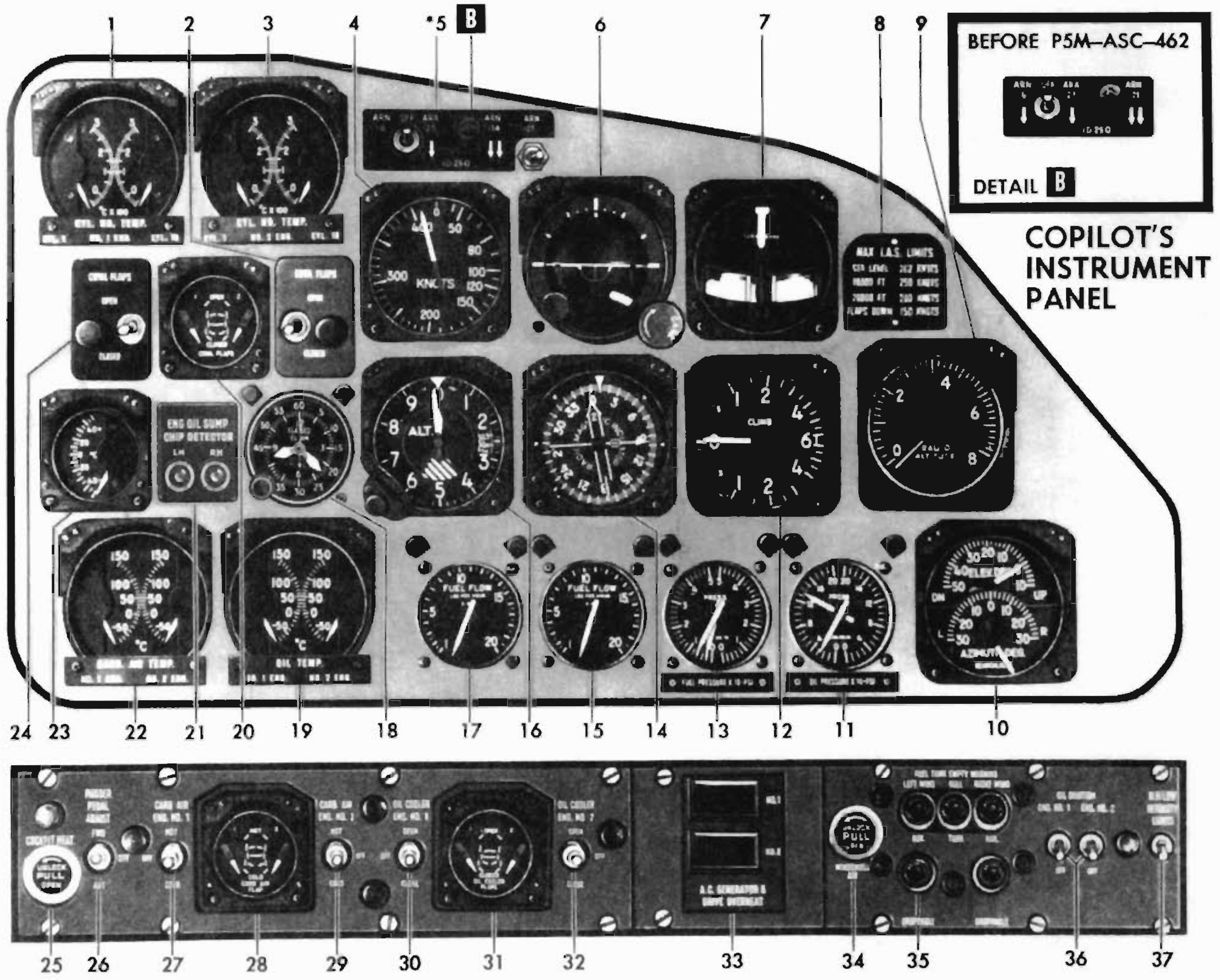
THE RADIO CALL FOR THIS AIRPLANE IS NAVY
MAX. I.A.S. LIMITS
A C POWER FAILURE
RADIO ALTIM

1. AIRSPEED LIMIT PLACARD
2. AIRSPEED INDICATOR
3. VERTICAL GYRO INDICATOR
4. TURN AND BANK INDICATOR
5. AC BUS POWER FAILURE INDICATOR LIGHT
6. TORQUE PRESSURE INDICATOR
7. HYDRO–FLAP OPEN INDICATOR LIGHT
*8. RADIO SELECTOR FOR RMI ID–250/ARN
9. TACHOMETER
10. MANIFOLD PRESSURE INDICATOR
11. RUDDER AND AILERON TRIM INDICATOR
12. RANGE INDICATOR ID–310/ARN
13. COURSE INDICATOR ID–249/ARN
14. PARTICAL LEVEL INDICATOR (AN/ASR–3)
15. RATE-OF-CLIMB INDICATOR
16. G–2 COMPASS MASTER DIRECTION INDICATOR
17. RADIO MAGNETIC INDICATOR ID–250/ARN
18. WING FLAP INDICATOR
19. ALTIMETER
20. EIGHT DAY CLOCK
21. RADIO ALTIMETER (AN/APN–1)
22. RADIO ALTIMETER LIMIT INDICATOR LIGHT
23. MK–8 GUNSIGHT LIGHT RHEOSTAT
24. MK–8 GUNSIGHT FILAMENT SELECTOR
25. COCKPIT HEAT CONTROL
26. G–2 COMPASS MASTER DIRECTION INDICATOR CONTROL
27. RUDDER PEDAL ADJUSTMENT CONTROL
28. MAIN HYDRAULIC SYSTEM PUMP CONTROLS
29. MAIN HYDRAULIC SYSTEM PRESSURE GAGE
30. FLIGHT BOOSTS HYDRAULIC SYSTEM PRESSURE GAGE
31. FLIGHT BOOST HYDRAULIC SYSTEM PUMP CONTROLS

*AFTER P5M–ASC–462

5-65142


BEFORE P5M–ASC–462
DETAIL B
COPILOT'S INSTRUMENT PANEL
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*5 B
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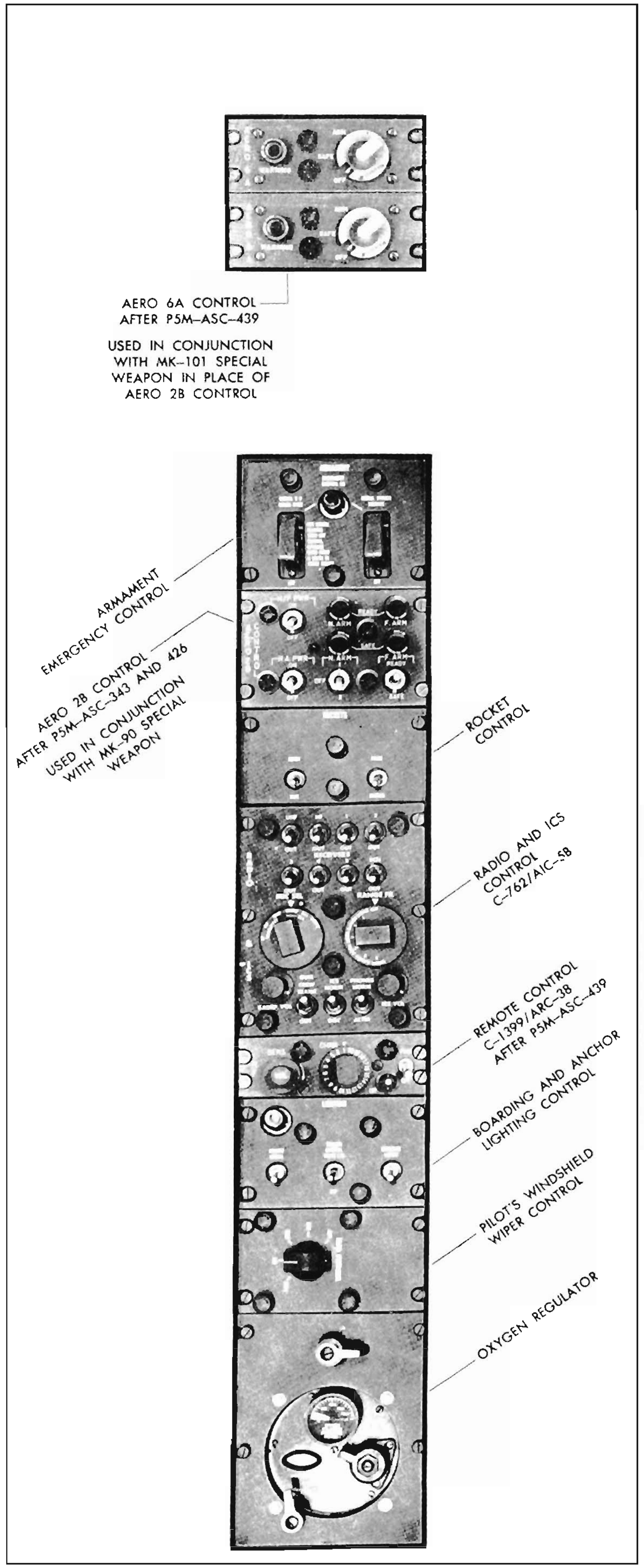
MAX I.A.S. LIMITS
ENG OIL SUMP CHIP DETECTOR
A.C. GENERATOR & DRIVE OVERHEAT

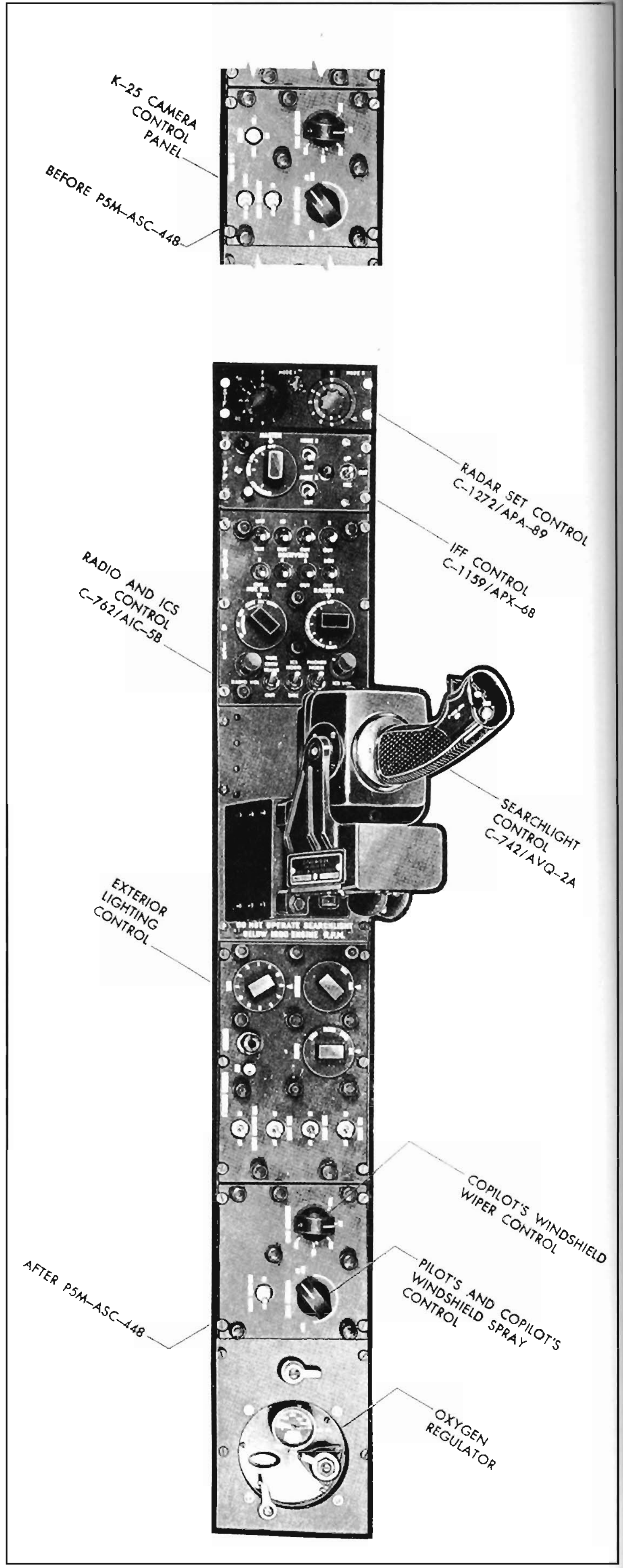
1. CYL HEAD TEMPERATURE GAGE, NO. 1 ENGINE
2. COWL FLAP CONTROL, NO. 2 ENGINE
3. CYL HEAD TEMPERATURE GAGE, NO. 2 ENGINE
4. AIRSPEED INDICATOR
*5. RADIO SELECTOR PANEL FOR RMI ID–250/ARN
6. GYRO HORIZON INDICATOR
7. TURN AND BANK INDICATOR
8. AIRSPEED LIMIT PLACARD
9. RADIO ALTIMETER (AN/APN–1)
10. SEARCH LIGHT POSITION INDICATOR
11. OIL PRESSURE GAGE
12. RATE-OF-CLIMB INDICATOR
13. FUEL PRESSURE GAGE
14. RADIO MAGNETIC INDICATOR ID–250/ARN
15. FUEL FLOW INDICATOR, NO. 1 ENGINE
16. ALTIMETER
17. FUEL FLOW INDICATOR, NO. 2 ENGINE
18. ELAPSE TIME CLOCK
19. OIL TEMPERATURE GAGE
20. COWL FLAP POSITION INDICATOR
21. ENGINE OIL SUMP CHIP DETECTOR
22. CARBURETOR AIR TEMPERATURE GAGE
23. OUTSIDE AIR TEMPERATURE GAGE
24. COWL FLAP CONTROL, NO. 1 ENGINE
25. COCKPIT HEAT CONTROL
26. RUDDER PEDAL ADJUSTMENT CONTROL
27. CARBURETOR AIR FLAP CONTROL, NO. 1 ENGINE
28. CARBURETOR AIR FLAP POSITION INDICATOR
29. CARBURETOR AIR FLAP CONTROL, NO. 2 ENGINE
30. OIL COOLER FLAP CONTROL, NO. 1 ENGINE
31. OIL COOLER FLAP POSITION INDICATOR
32. OIL COOLER FLAP CONTROL, NO. 2 ENGINE
33. AC GENERATOR AND DRIVE OVERHEAT INDICATOR
34. COPILOT'S WINDSHIELD AIR CONTROL
35. FUEL TANK EMPTY WARNING LIGHTS
36. OIL DILUTION CONTROLS
37. COPILOT'S LOW INTENSITY LIGHT CONTROL

*AFTER P5M–ASC–462

PILOT'S LEFT-HAND PANEL

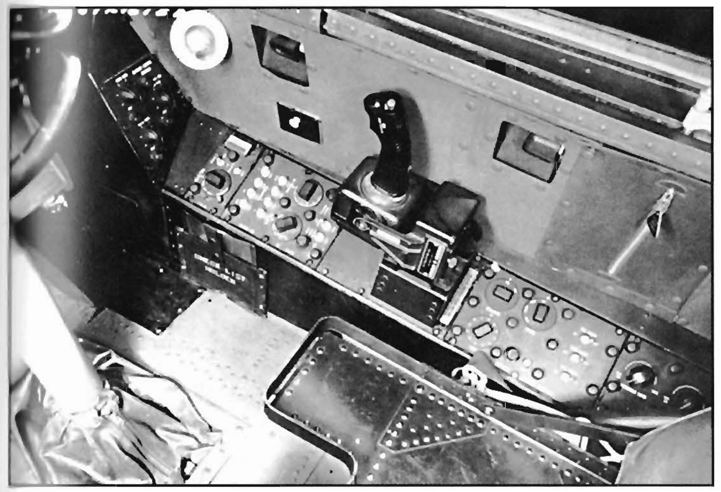

AERO 6A CONTROL
AFTER P5M–ASC–439
USED IN CONJUNCTION
WITH MK–101 SPECIAL
WEAPON IN PLACE OF
AERO 2B CONTROL
ARMAMENT
EMERGENCY CONTROL
AERO 2B CONTROL
AFTER P5M–ASC–343 AND 426
USED IN CONJUNCTION
WITH MK–90 SPECIAL
WEAPON
ROCKET
CONTROL
RADIO AND ICS
CONTROL
C–762/AIC–58
REMOTE CONTROL
C–1399/ARC–38
AFTER P5M–ASC–439
BOARDING AND ANCHOR
LIGHTING CONTROL
PILOT'S WINDSHIELD
WIPER CONTROL
OXYGEN REGULATOR

COPILOT'S RIGHT-HAND PANEL


K–25 CAMERA
CONTROL
PANEL
BEFORE P5M–ASC–448
RADAR SET CONTROL
C–1272/APA–89
IFF CONTROL
C–1159/APX–68
RADIO AND ICS
CONTROL
C–762/AIC–58
SEARCHLIGHT
CONTROL
C–742/AVQ–2A
EXTERIOR
LIGHTING
CONTROL
COPILOT'S WINDSHIELD
WIPER CONTROL
PILOT'S AND COPILOT'S
WINDSHIELD SPRAY
CONTROL
AFTER P5M–ASC–448
OXYGEN
REGULATOR

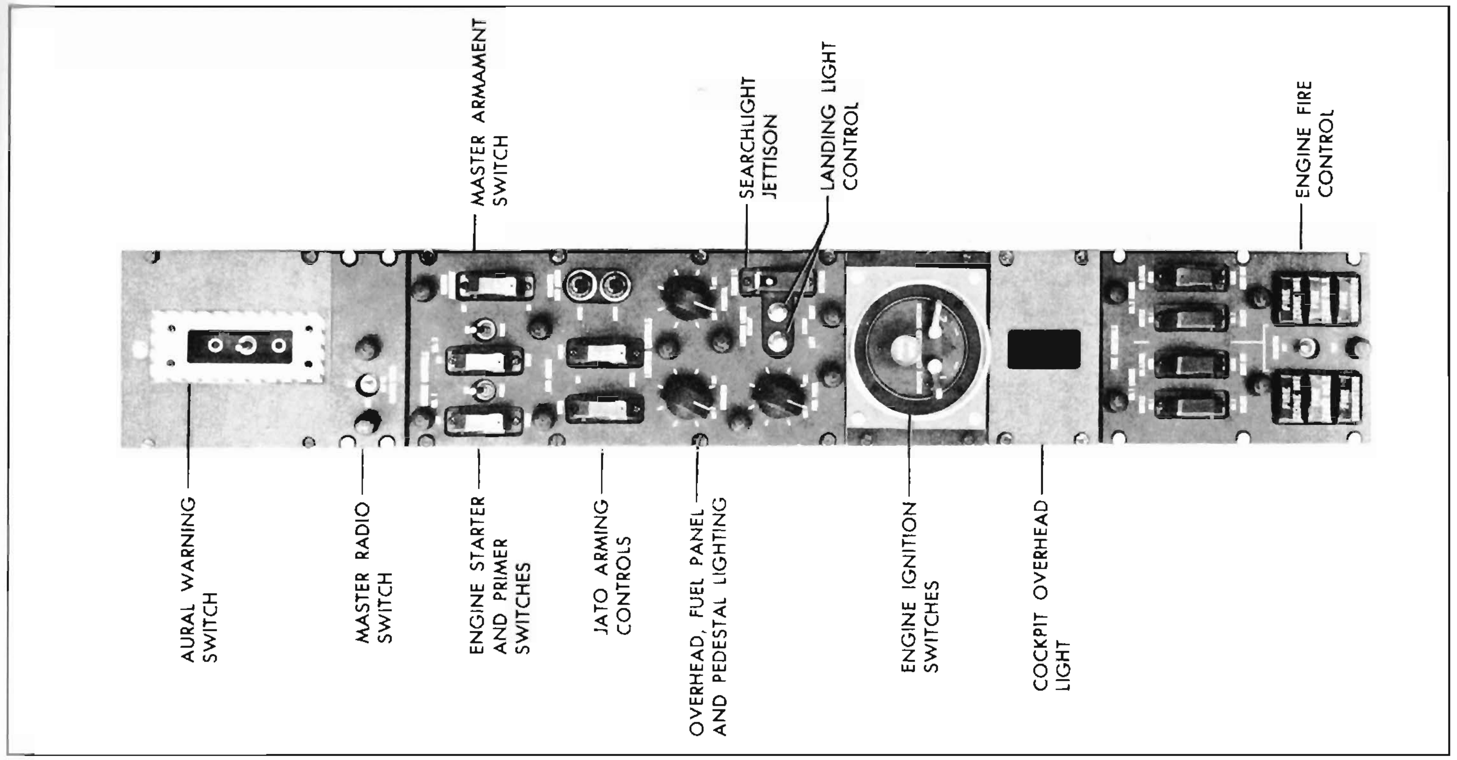
PILOT'S LEFT-HAND PANEL

COPILOT'S RIGHT-HAND PANEL



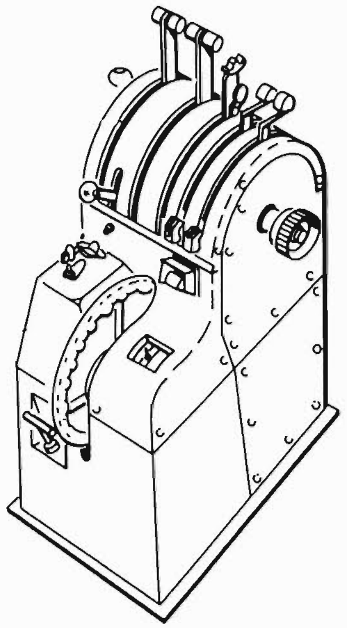
COCKPIT OVERHEAD CONSOLE

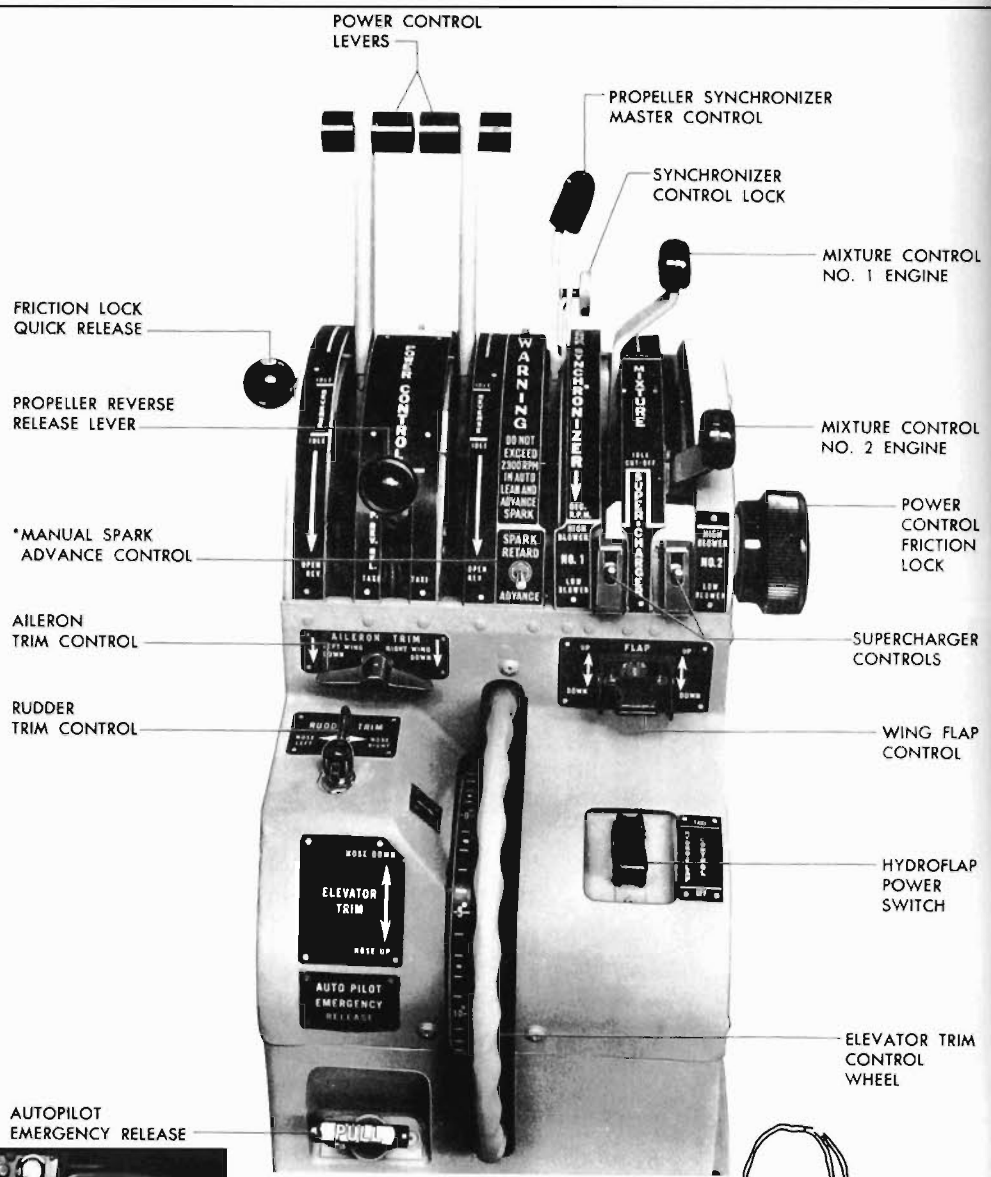
COCKPIT OVERHEAD CONSOLE

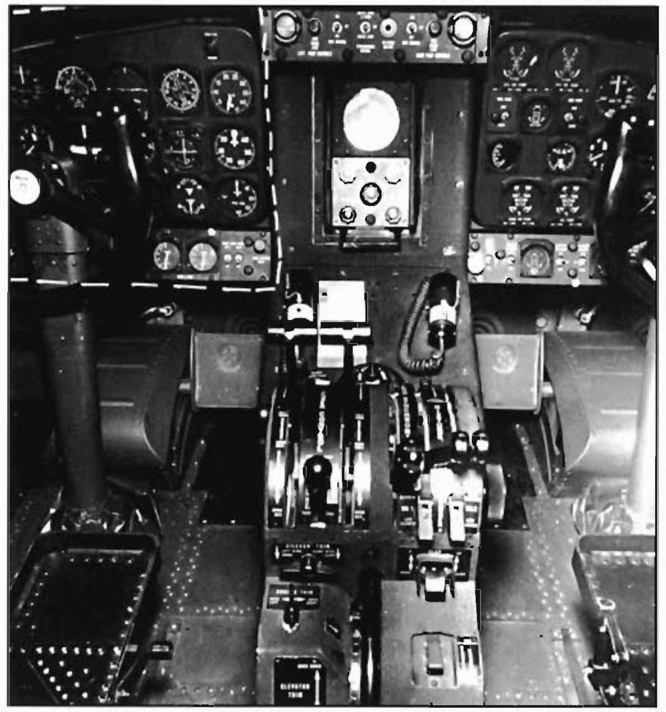

AURAL WARNING
SWITCH
MASTER RADIO
SWITCH
ENGINE STARTER
AND PRIMER
SWITCHES
MASTER ARMAMENT
SWITCH
JATO ARMING
CONTROLS
OVERHEAD, FUEL PANEL
AND PEDESTAL LIGHTING
SEARCHLIGHT
JETTISON
LANDING LIGHT
CONTROL
ENGINE IGNITION
SWITCHES
COCKPIT OVERHEAD
LIGHT
ENGINE FIRE
CONTROL

PILOT'S CENTER PEDESTAL

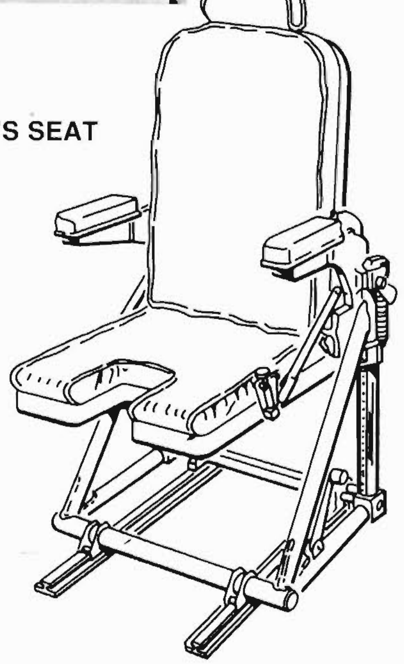
PILOTS' PEDESTAL



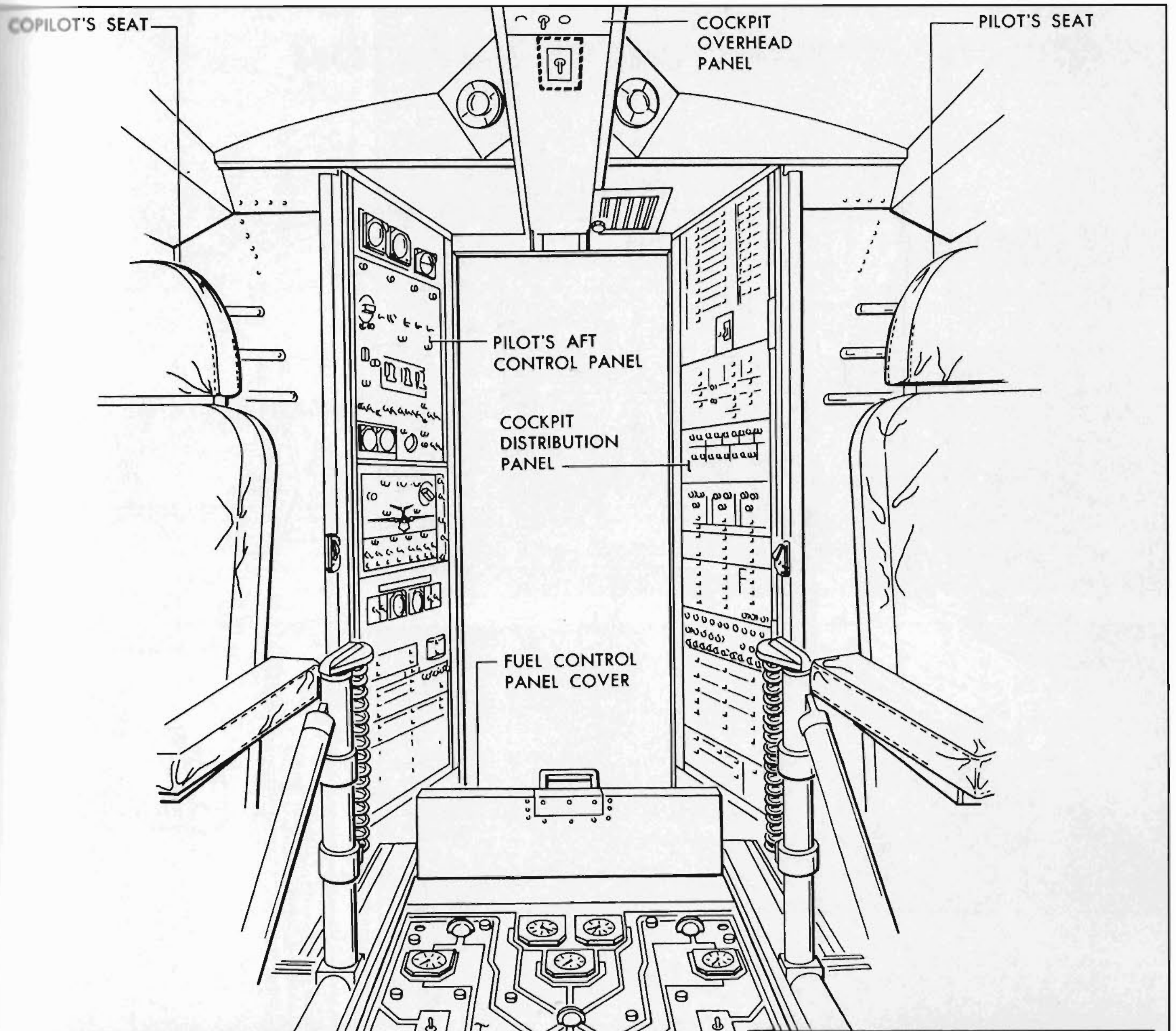

POWER CONTROL LEVERS
PROPELLER SYNCHRONIZER MASTER CONTROL
SYNCHRONIZER CONTROL LOCK
MIXTURE CONTROL NO. 1 ENGINE
FRICTION LOCK QUICK RELEASE
PROPELLER REVERSE RELEASE LEVER
MIXTURE CONTROL NO. 2 ENGINE
POWER CONTROL FRICTION LOCK
*MANUAL SPARK ADVANCE CONTROL
AILERON TRIM CONTROL
SUPERCHARGER CONTROLS
RUDDER TRIM CONTROL
WING FLAP CONTROL
HYDROFLAP POWER SWITCH
ELEVATOR TRIM CONTROL WHEEL
AUTOPILOT EMERGENCY RELEASE
WARNING
DO NOT EXCEED 2300 RPM IN AUTO LEAN AND ADVANCE SPARK
SPARK RETARD
ADVANCE
SYNCHRONIZER
MIXTURE
SUPERCHARGER
AILERON TRIM
RUDDER TRIM
FLAP
ELEVATOR TRIM
NOSE DOWN
NOSE UP
AUTO PILOT EMERGENCY RELEASE
PULL

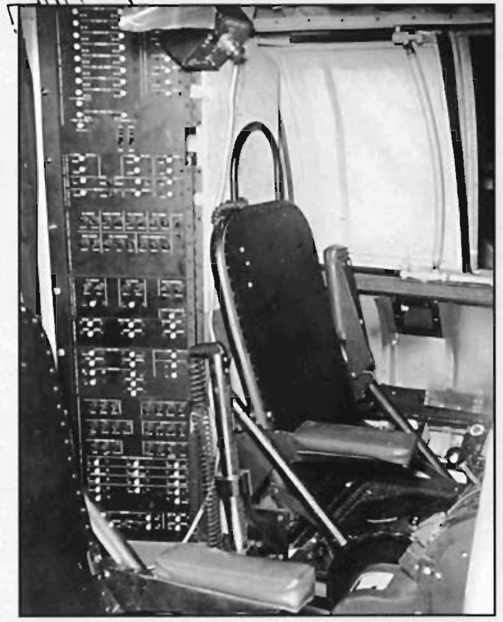


PILOT'S/COPILOT'S SEAT

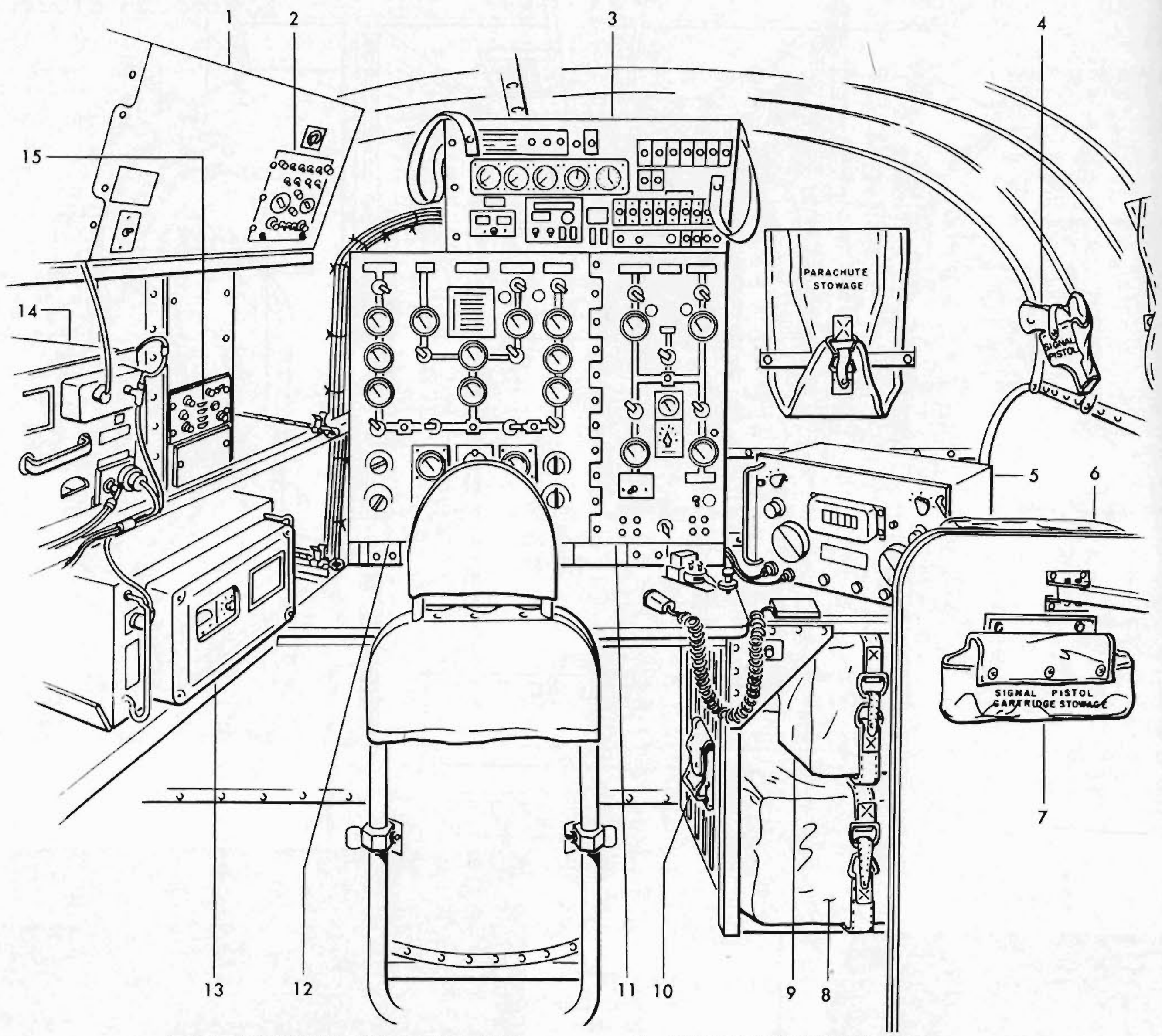


AFT PILOT'S COMPARTMENT


COPILOT'S SEAT
COCKPIT OVERHEAD PANEL
PILOT'S SEAT
PILOT'S AFT CONTROL PANEL
COCKPIT DISTRIBUTION PANEL
FUEL CONTROL PANEL COVER
FUEL CONTROL PANEL



RADIO OPERATOR'S STATION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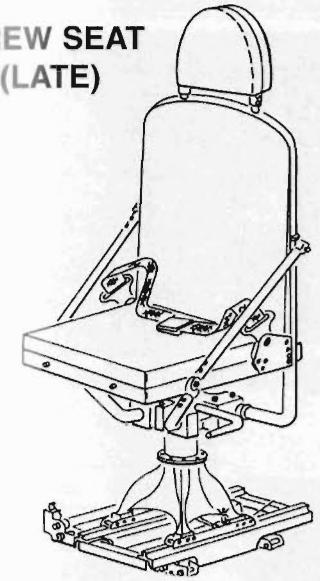
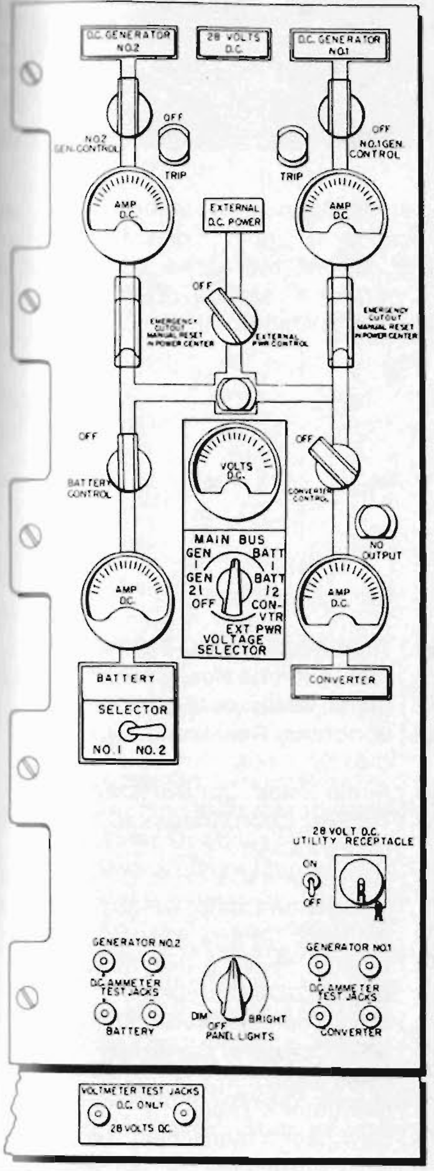
15
PARACHUTE STOWAGE
SIGNAL PISTOL
SIGNAL PISTOL CARTRIDGE STOWAGE

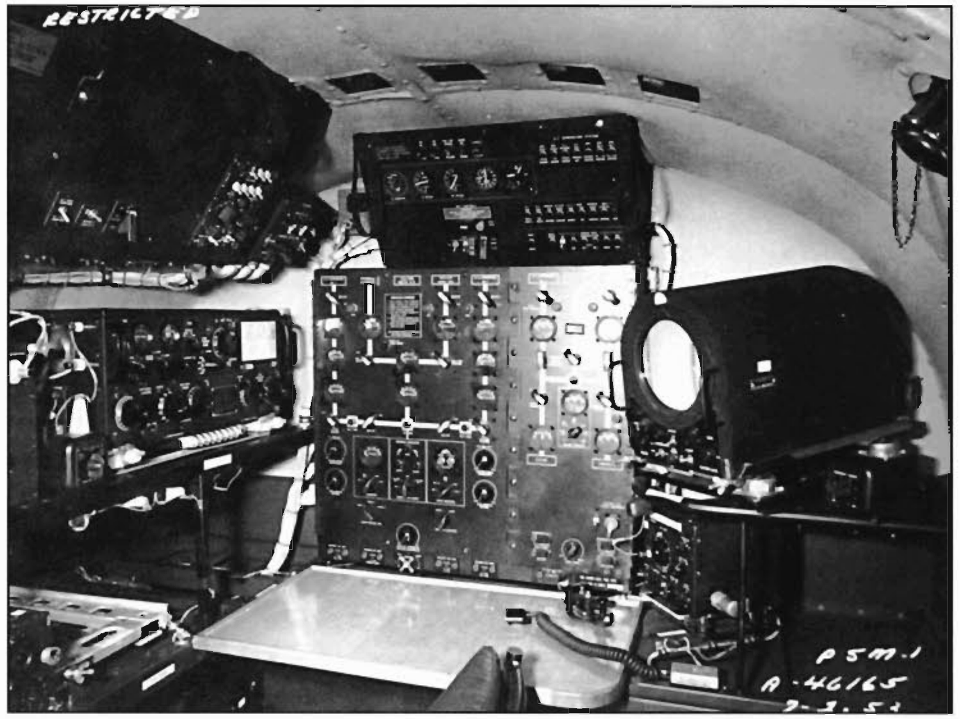
1. RADIO OPERATOR'S OVERHEAD PANEL
2. ICS CONTROL C-762/A1C-5B
3. APU CONTROL AND CIRCUIT BREAKER PANEL
4. SIGNAL PISTOL
5. HF RECEIVER R-648/ARR-41
6. LIFERAFT
7. SIGNAL PISTOL CARTRIDGE CONTAINER
8. LIFERAFT EMERGENCY TRANSMITTER
9. LIFERAFT EMERGENCY FOOD CONTAINER
10. MULTIMETER STOWAGE
11. DC CONTROL PANEL
12. AC CONTROL PANEL
13. RECEIVER TRANSMITTER RT-311/ARC-38
14. ANTENNA COUPLER CU-351/AR
15. HF TRANSCEIVER CONTROL C-1398/ARC-38

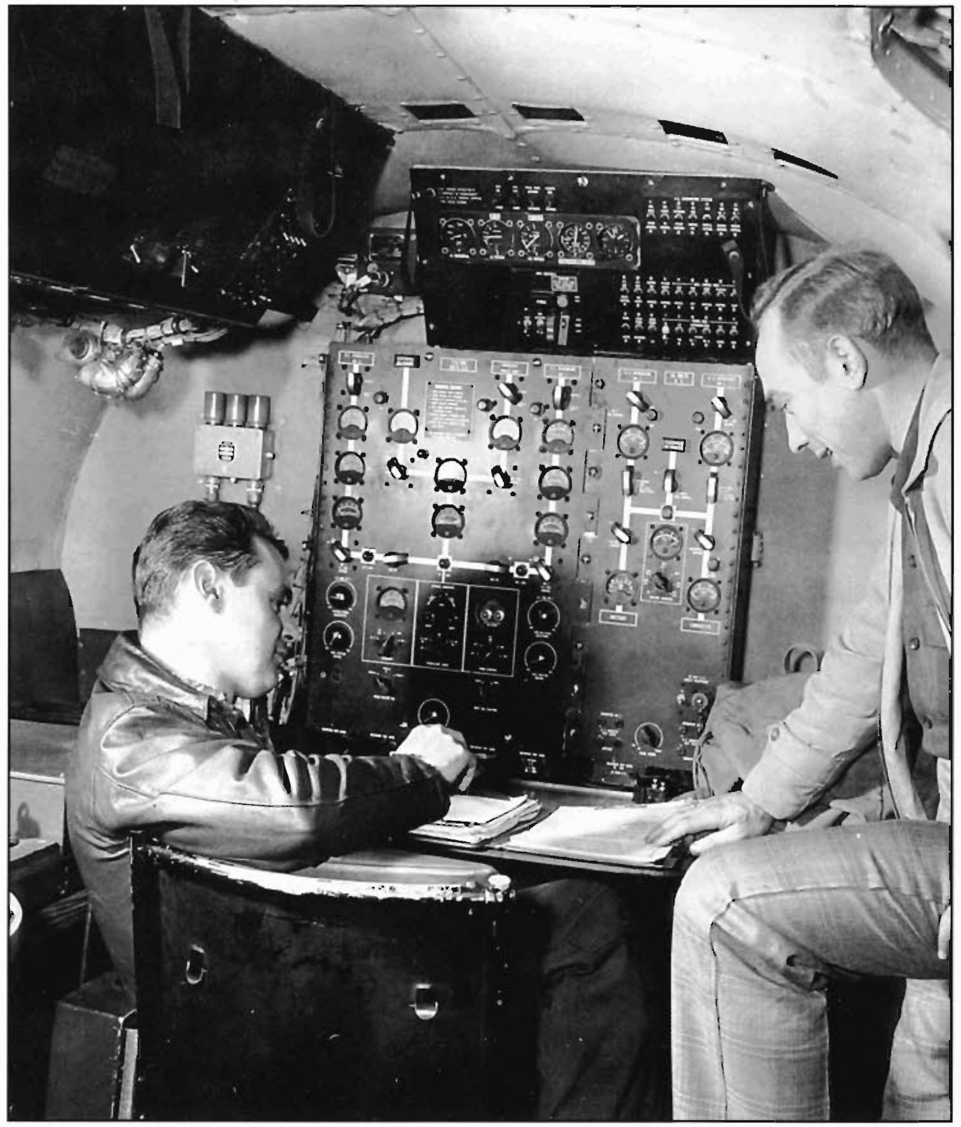
CREW SEAT (LATE)



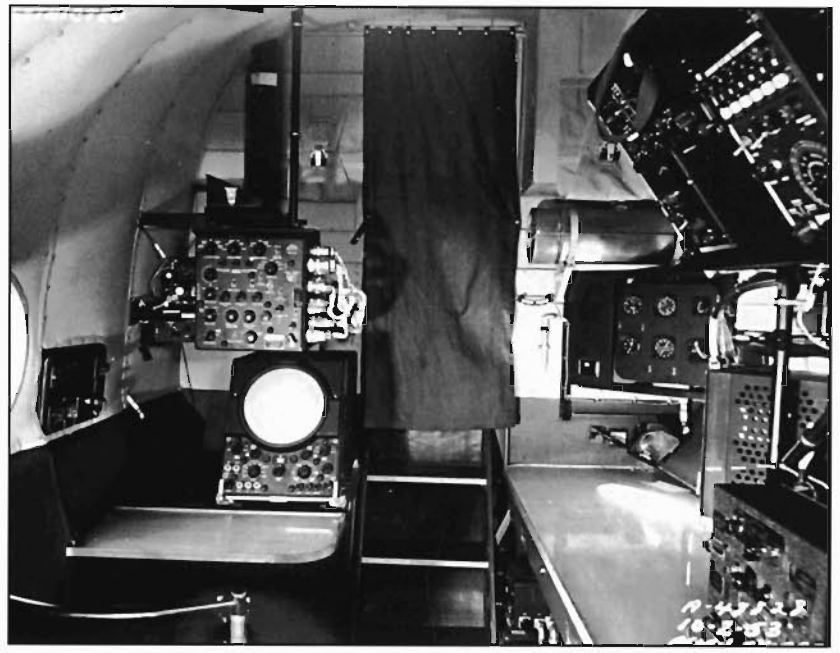
RADIO OPERATOR'S DC CONTROL PANEL

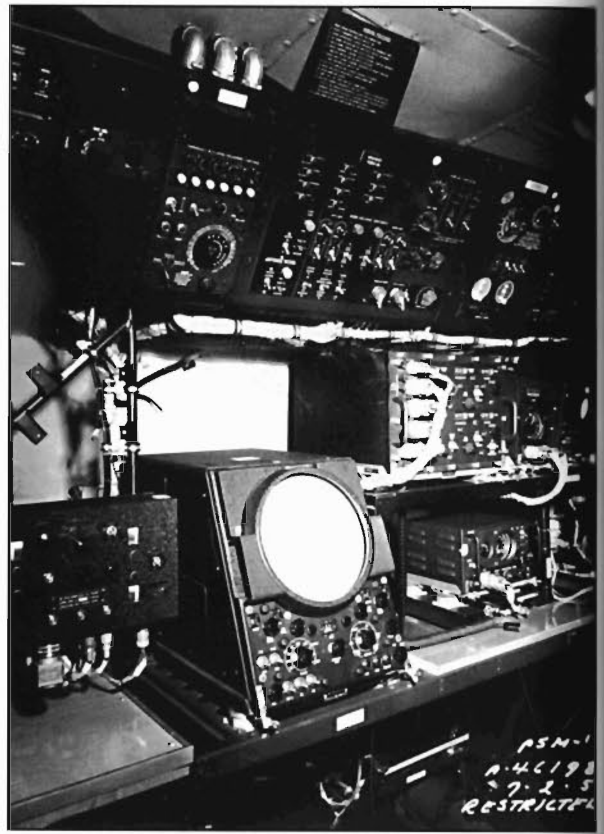

D.C. GENERATOR NO.2
28 VOLTS D.C.
D.C. GENERATOR NO.1
OFF
NO.2 GEN. CONTROL
TRIP
TRIP
OFF
NO.1 GEN. CONTROL
AMP D.C.
EXTERNAL D.C. POWER
AMP DC
OFF
EMERGENCY CUTOUT MANUAL RESET IN POWER CENTER
EXTERNAL PWR CONTROL
EMERGENCY CUTOUT MANUAL RESET IN POWER CENTER
OFF
BATTERY CONTROL
VOLTS D.C.
OFF
CONVERTER CONTROL
NO OUTPUT
MAIN BUS
GEN 1
BATT 1
GEN 2 1
BATT 1 2
OFF
CON-VTR
EXT PWR
VOLTAGE SELECTOR
AMP D.C.
AMP D.C.
BATTERY
SELECTOR
NO.1 NO.2
CONVERTER
28 VOLT D.C. UTILITY RECEPTACLE
ON
OFF
GENERATOR NO.2
D.C. AMMETER TEST JACKS
BATTERY
DIM
OFF
BRIGHT
PANEL LIGHTS
GENERATOR NO.1
D.C. AMMETER TEST JACKS
CONVERTER
VOLTMETER TEST JACKS
D.C. ONLY
28 VOLTS D.C.

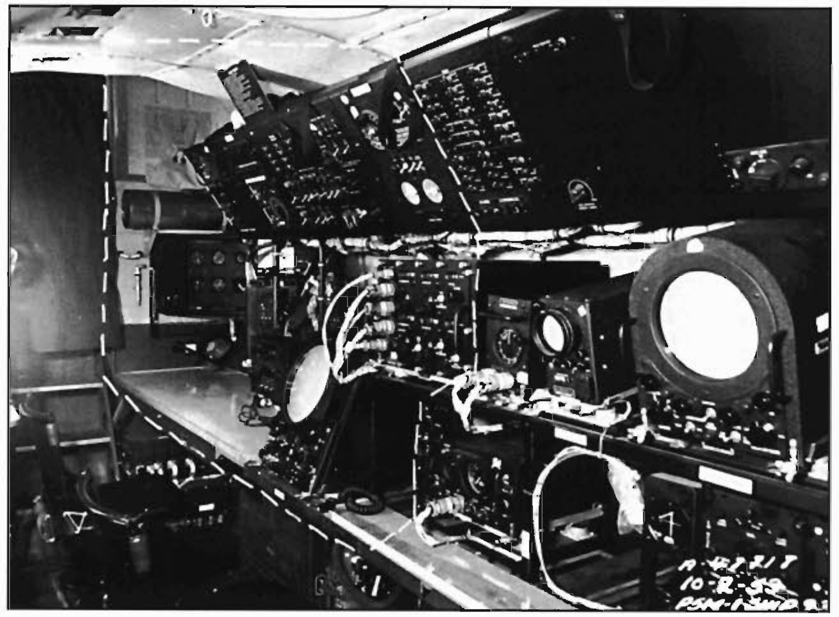

RESTRICTED
P5M-1
A-46165



P5M FLIGHT DECK ARRANGEMENT BEFORE ASC-439



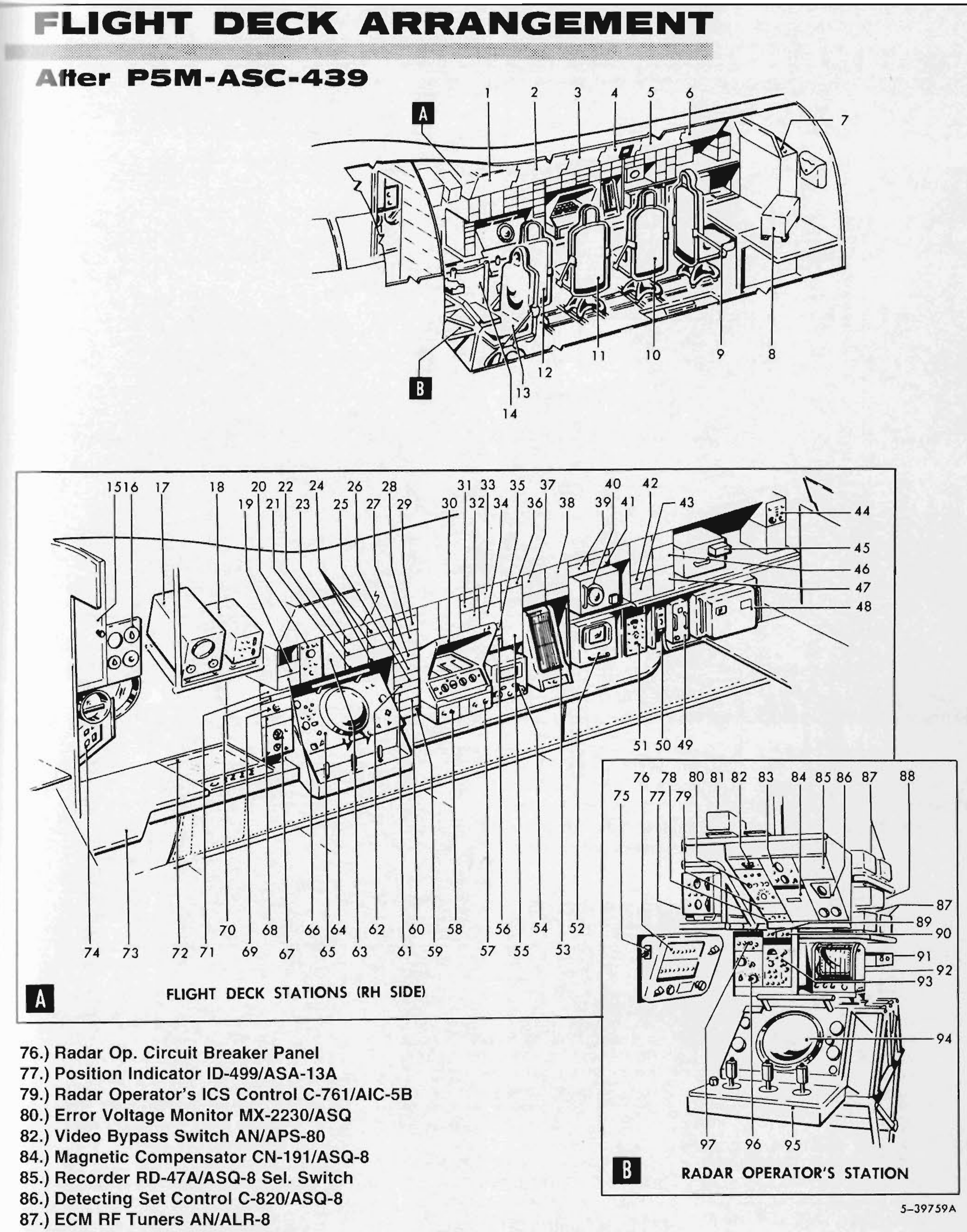

P5M-1
A-4619
7-2-5
RESTRICTE


A-47217
10-8-5
P5M-1SWD

Above left, Sonar Operator's station on left and Navigator's station at right. Pilot's compartment entrance is at top of the steps. (USN) Above, Sonobuoy Operator's station. (USN) At left, ECM/MAD Operator's station. (USN)

1.) Navigator's and Tactical Coordinator's Overhead Panel
2.) Navigator's Armament Panel
3.) Jezebel Operator's Overhead Panel
4.) Forward Julie/ECM Operator's Overhead Panel
5.) Aft Julie/ECM Operator's Overhead Panel
6.) Radio Operatator's Overhead Panel
7.) AC, DC and APU Control Panels
8.) HF Receviver R-648/ARR-41
9.) Radio Operator's Seat
10.) Julie/ECM Operator's Seat
11.) Jezebel Operator's Seat
12.) Tactical Coordinator's Seat
13.) Radar Operator's Seat
14.) Navigator's Seat
15.) Pilot's Locker
16.) Engine Analyzer Control
17.) Indicator ID-6B/APN-4
18.) Position Indicator ID-499/ASA-13
20.) Intervalometer ID-239A
21.) Ground Track Plotter Remote Control C-2404/asa-13
31.) Jezebel Operator's ICS Control C-761/AIC-5B
34.) Jezebel and Julie/ECM Operator's ASW/NORMAL INTERPHONE Sel.
35.) Tape Recorder Remote Control AN/UNH-6
36.) Sonobuoy Homing Switch AN/ARR-26
42.) Antenna Verification Panel AN/ALR-3
43.) ECM Control C-1933/ALR-3
44.) Control C-1398/ARC-38
45.) Antenna Coup. CV-351/AR(AN/ARC-38)
47.) ECM Selector Panel AN/ALR-3-AN/ALR-8
48.) Receiver Transmitter RT-311/ARC-38
49.) Tape Recorder RO-28/UN/UNH-6
50.) Trail Antenna Reel Control BC-461
52.) Signal Analyzer IP-37/APA-74
55.) Sonobuoy Receiver Control C-610/ARR-26
56.) Audio Select Control AN/AQA-1
63.) Tactical Coordinator's ICS Control C-762/AIC-5B
66.) Navigator's ICS Cont. C-761/AIC-5B
67.) Navigation Comp. CP-381/ASA-13A
68.) Indicator Control APN-122
69.) Ground Speed & Drift Indicator APA-122/C-2683/-ID-733
70.) MF-1 Compass Roll Stabilization
71.) MF-1 Compass Controller
72.) Dead Reckoning Tracer PT-396/AS
73.) Navigator's Table
74.) Navigator's Instrument Panel
75.) ASW/Normal Interphone Selector

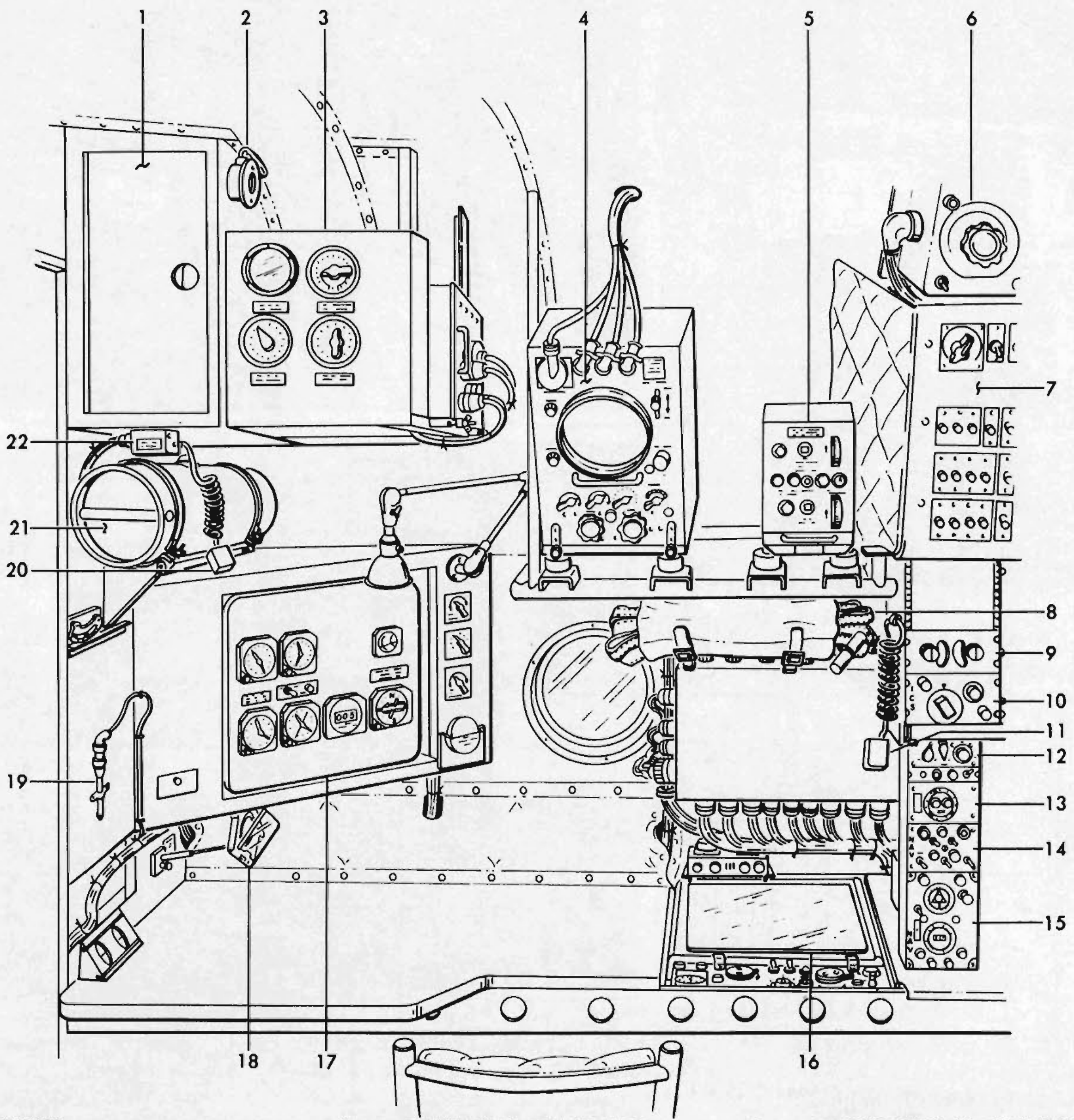
P5M FLIGHT DECK ARRANGEMENT AFTER ASC-439


FLIGHT DECK ARRANGEMENT
After P5M-ASC-439
A
B
1 2 3 4 5 6 7
8 9 10 11 12 13 14
15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43
44 45 46 47 48
51 50 49
52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74
A
FLIGHT DECK STATIONS (RH SIDE)
75 76 77 78 79 80 81 82 83 84 85 86 87 88
87 89 90 91 92 93 94
97 96 95
B
RADAR OPERATOR'S STATION
5-39759A

76.) Radar Op. Circuit Breaker Panel
77.) Position Indicator ID-499/ASA-13A
79.) Radar Operator's ICS Control C-761/AIC-5B
80.) Error Voltage Monitor MX-2230/ASQ
82.) Video Bypass Switch AN/APS-80
84.) Magnetic Compensator CN-191/ASQ-8
85.) Recorder RD-47A/ASQ-8 Sel. Switch
86.) Detecting Set Control C-820/ASQ-8
87.) ECM RF Tuners AN/ALR-8
88.) RF Tuner Selector Switch Panel
89.) Retro-ejector Remote Release Button
90.) Detecting Set AN/ASR-3 Remote Mark Button
91.) Position Deviation Indicator ID-378/ASQ-8
92.) Recorder RD-47A/ASQ-8
97.) Radar Recognition Control C-1040/APX-7

All other numbers refer to P5M NAVWEPS 01-35EJA-1A

NAVIGATOR'S STATION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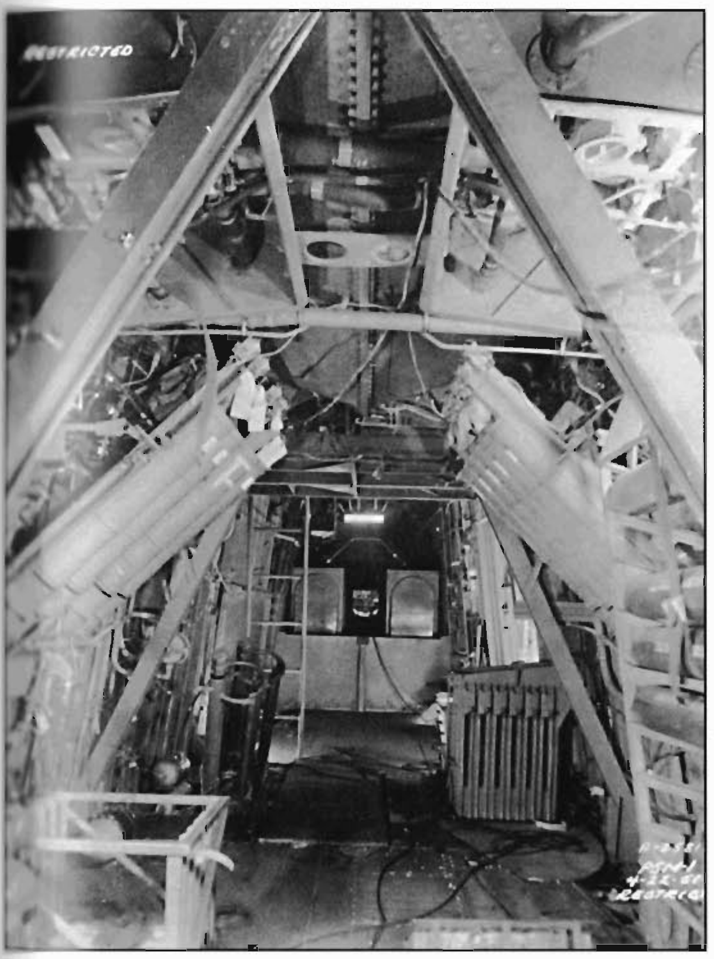
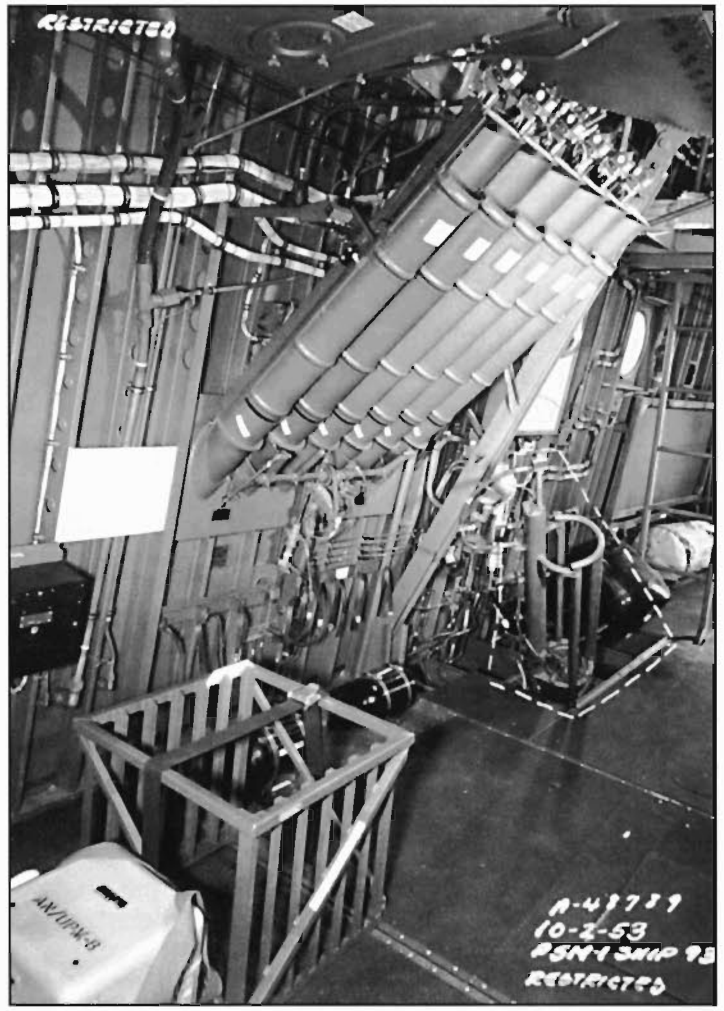
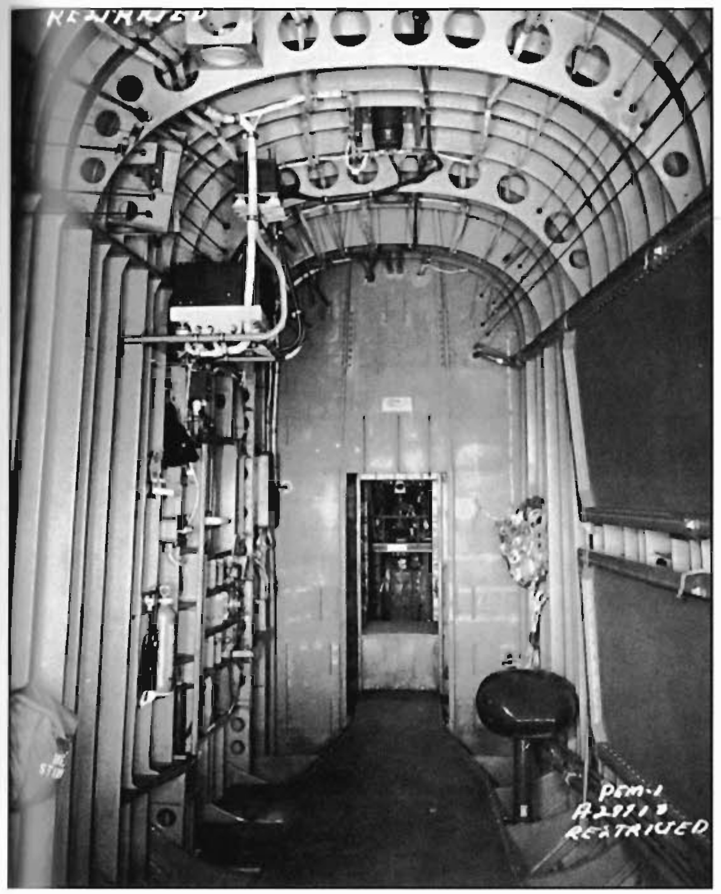
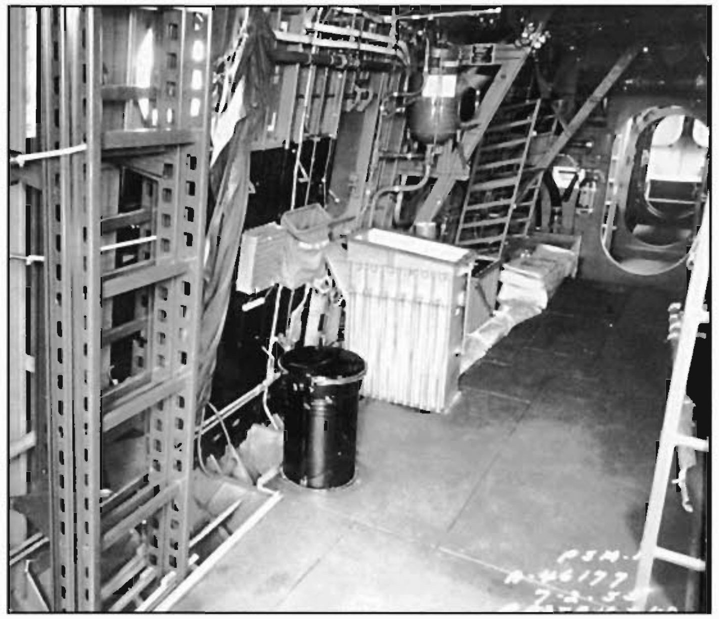
1. LOCKER
2. AURAL WARNING SIGNAL HORN
3. ENGINE ANALYZER CONTROL PANEL
4. LORAN NAVIGATION INDICATOR
5. GROUND POSITION INDICATOR
6. RETRO MARINE MARKER REMOTE CONTROL
7. NAVIGATOR'S AND TACTICAL COORDINATOR'S OVERHEAD PANEL
8. ELECTRONIC EQUIPMENT DITCHING NET STOWAGE
9. NAVIGATION COMPUTER POSITION INDICATOR
10. NAVIGATOR'S ICS CONTROL
11. NAVIGATOR'S MICROPHONE AND HEADSET EXTENSION CORD
12. MF-1 COMPASS CONTROL
13. GROUND SPEED AND DRIFT ANGLE INDICATOR
14. DOPPLER INERTIAL NAVIGATOR CONTROL
15. NAVIGATIONAL COMPUTER CONTROL
16. DEAD RECKONING TRACER
17. NAVIGATOR'S INSTRUMENT PANEL
18. GUN-SIGHT STOWAGE
19. CABIN HEAT THERMOSTAT SENSING ELEMENT
20. PLANE CAPTAIN'S MICROPHONE AND HEADSET EXTENSION CORD
21. WATER BREAKER
22. PLANE CAPTAIN'S ICS CONTROL


RESTRICTED

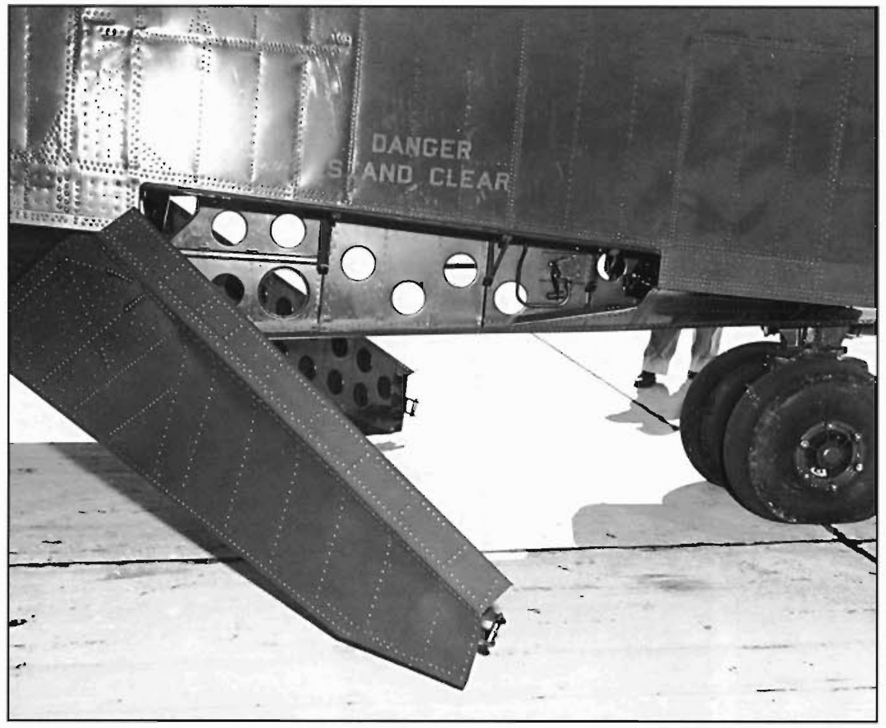

RESTRICTED
A-47739
10-2-53
PSNY SHOP 93
RESTRICTED

Above, two views of the Sonobuoy compartment on 2 October 1953. (National Archives) At left, view looking at aft end of the bunk compartment. (National Archives) Below, waist compartment looking forward in July 1953. Large black can was the toilet. (National Archives)

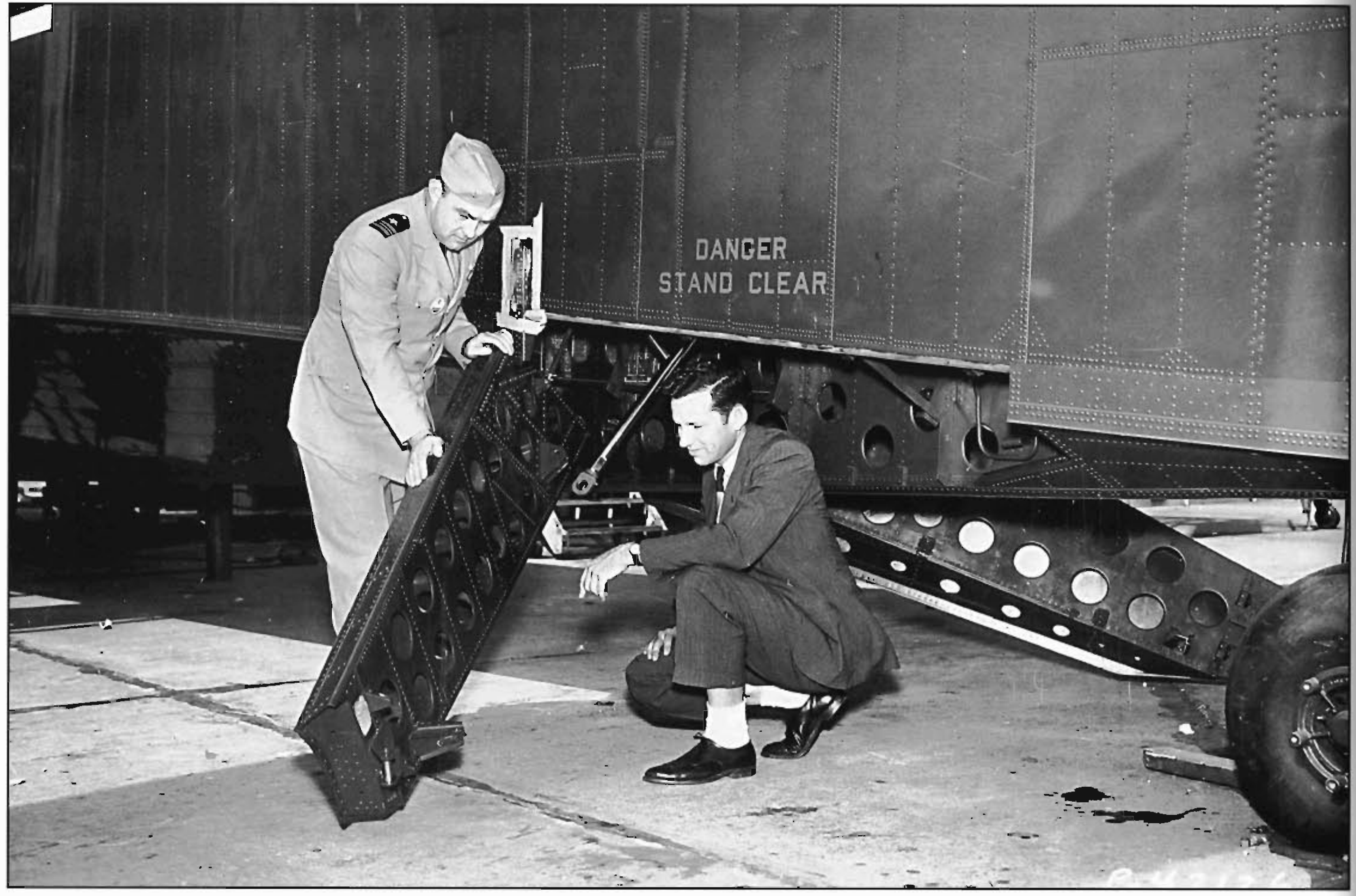

RESTRICTED
PSM-1
RESTRICTED


PSM-1
A-46177

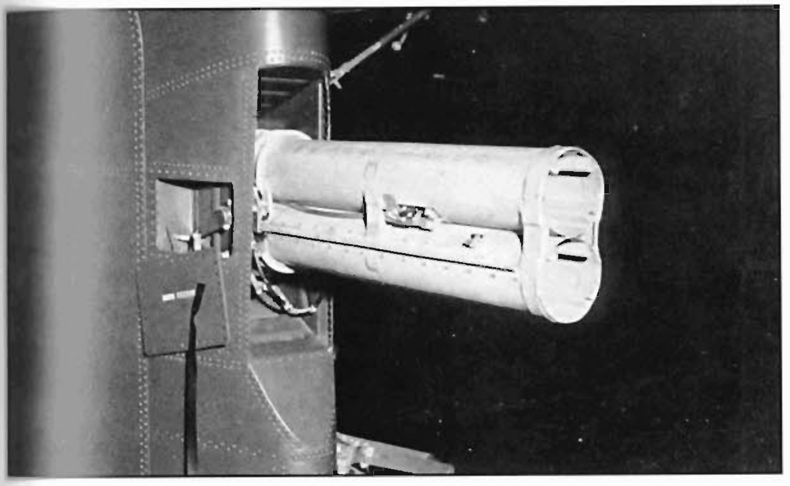
AFT HULL HYDROFLAPS



The hydroflaps, one on each side of the keel between the chine and keel, extended from station 893 to station 984. They were hinged at the forward end, and moved down and forward. The flaps were used slow the airplane after landing and to maneuver the airplane during water operations. The flaps were operated by either the pilot's or copilot's toe pedals. (Martin and National Archives)

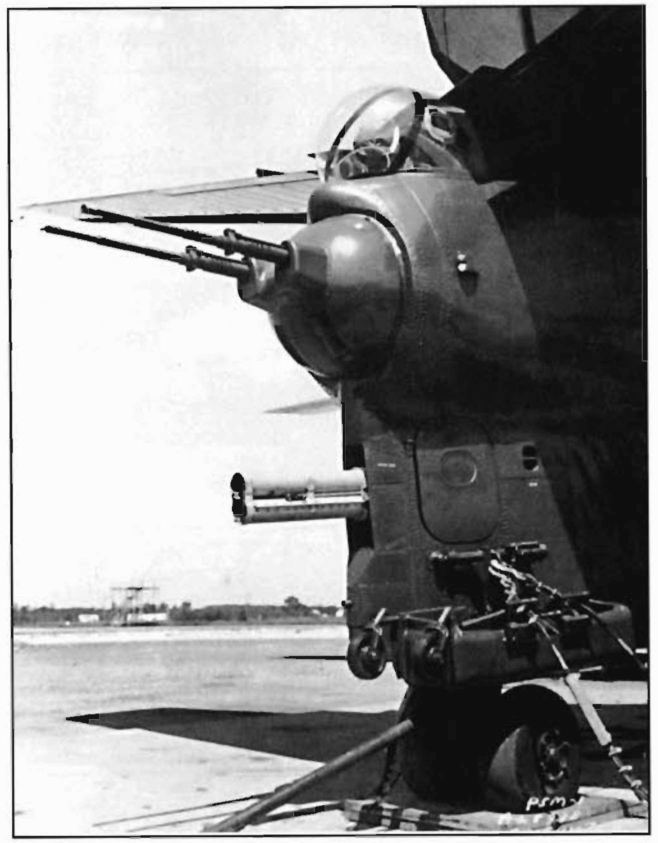


TAIL AND AND WING ARMAMENT

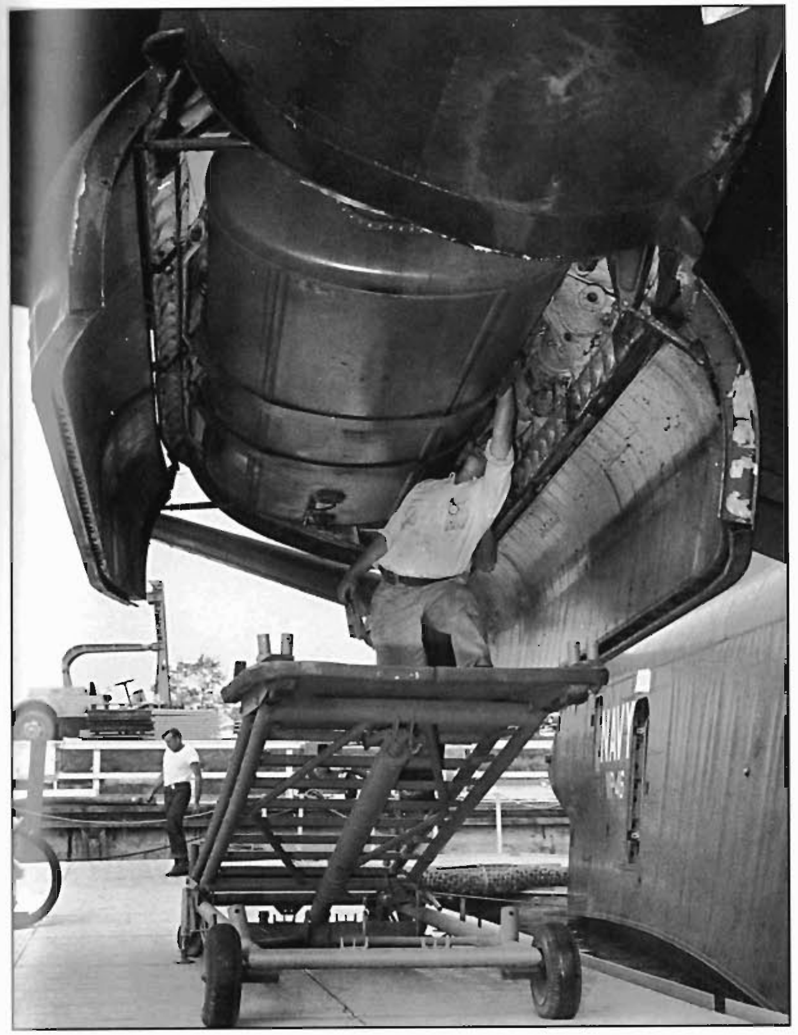


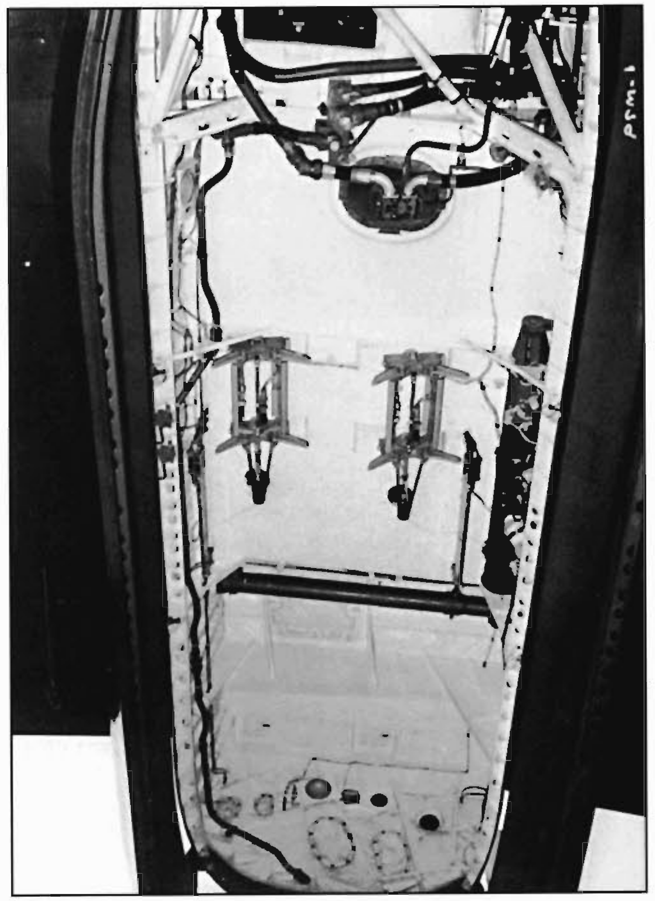
Bomb bay doors were controlled by the Master Armament switch on the pilot's side console, and the left and right door control switches on either the pilot's or navigator's armament panel. For wing stores, hoisting was accomplished from the top of the wing by using the integral handling fittings and Aero 14A or Aero 14B bomb hoist.

At right, P5M-1 tail turret on BuNo 124912 in October 1953. (USN) Above and at right, tail stinger, proposed rocket launcher tubes. tested on BuNo 124912. (USN) Below, 575 gallon bomb bay fuel cell installation. (Martin)

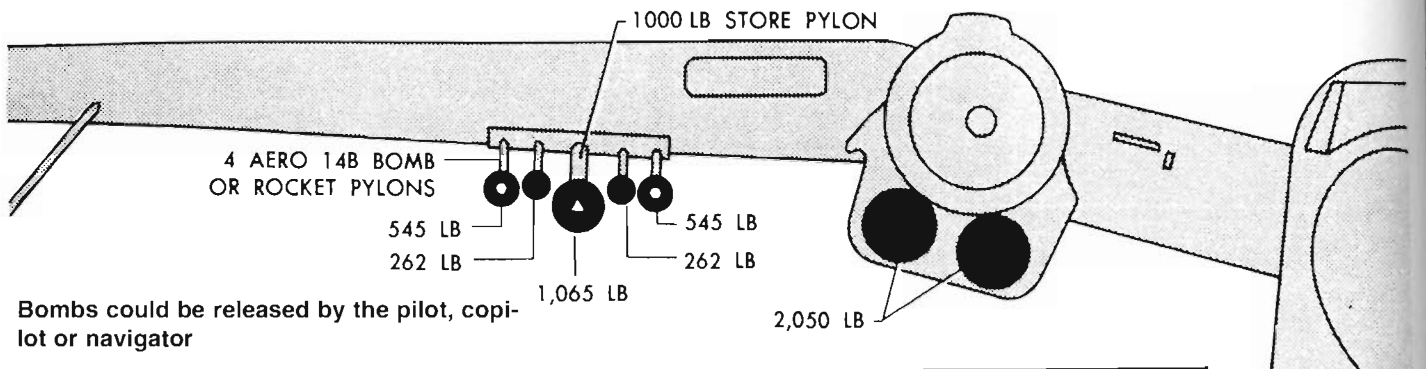


Below, empty P5M-1 bomb bay with two bomb racks installed on BuNo 124912. (National Archives)





MAXIMUM STORES LOADING

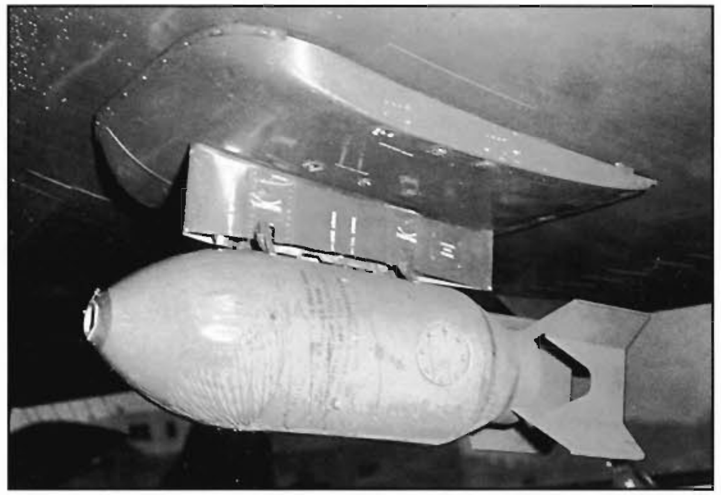

1000 LB STORE PYLON
4 AERO 14B BOMB OR ROCKET PYLONS
545 LB
262 LB
1,065 LB
545 LB
262 LB
2,050 LB

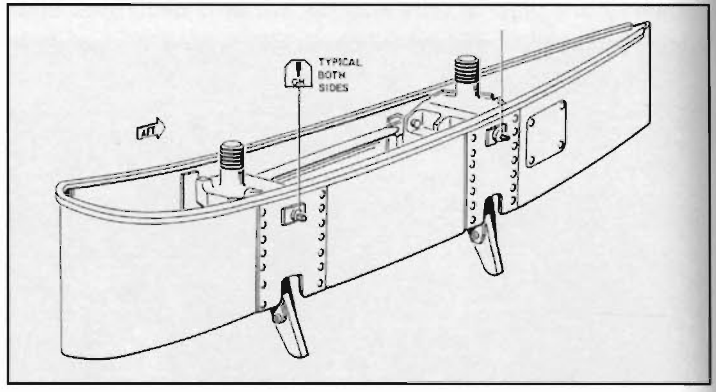
Bombs could be released by the pilot, copilot or navigator

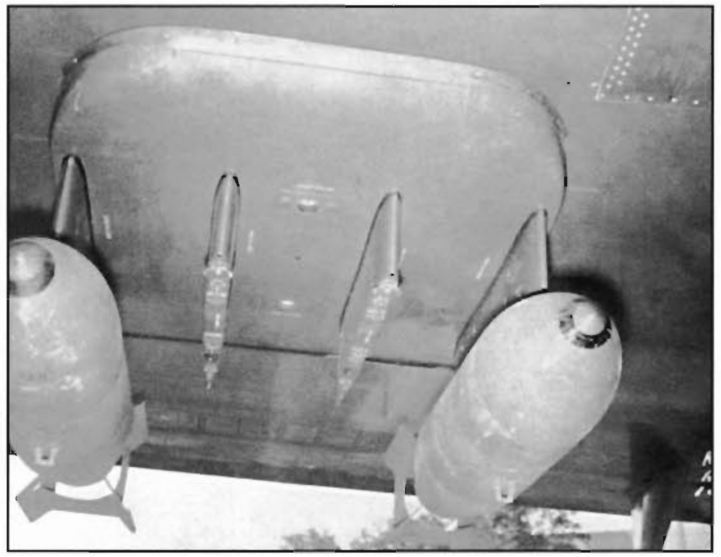
MAXIMUM STORES LOADING FOR EACH SIDE OF AIRPLANE

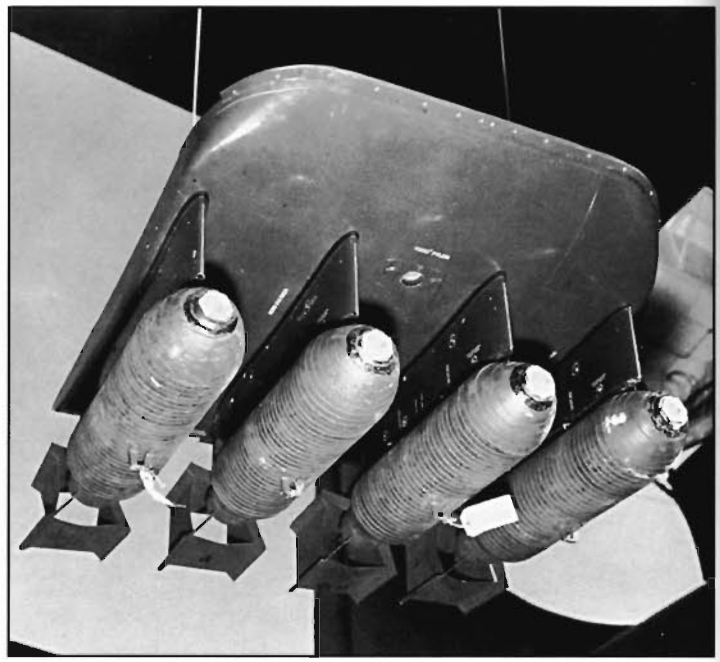
4	262 LB	● ● ● ●	STORES EXTERNAL, OR
2	545 LB	◉ ◉	STORES EXTERNAL, OR
1 2	1,065 LB 2,050 LB	● ▲ ●	STORES EXTERNAL AND STORES INTERNAL

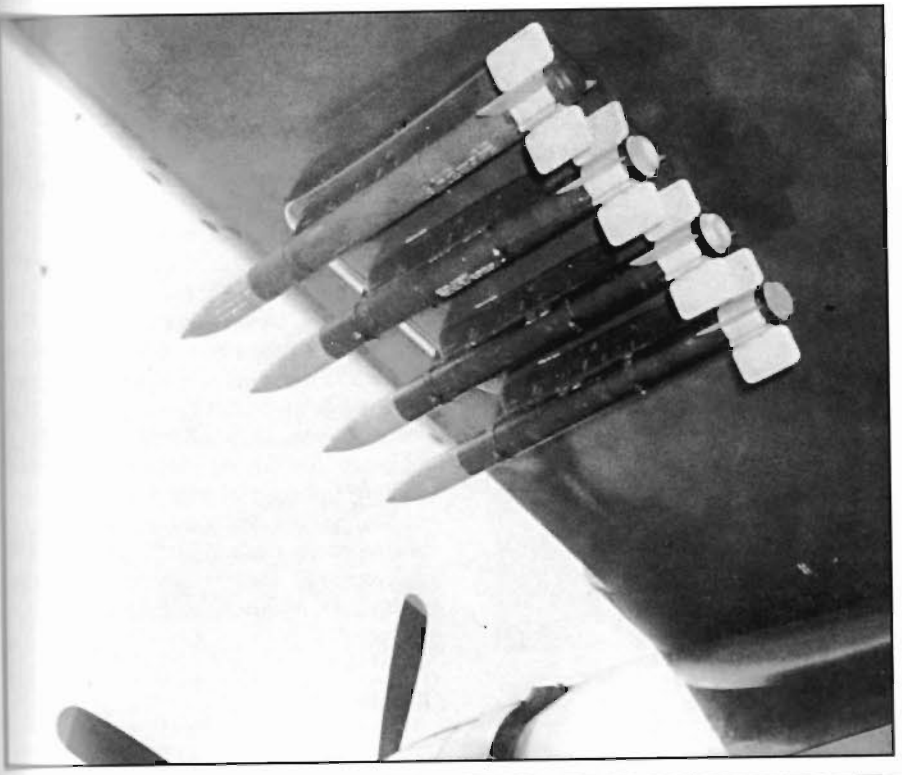
MAXIMUM LOAD ON EXTERNAL CARRIERS SHALL NOT EXCEED 1,090 LB
MAXIMUM LATERAL AIRPLANE UNBALANCE SHALL NOT EXCEED 128,000 FT LB




TYPICAL BOTH SIDES
AFT

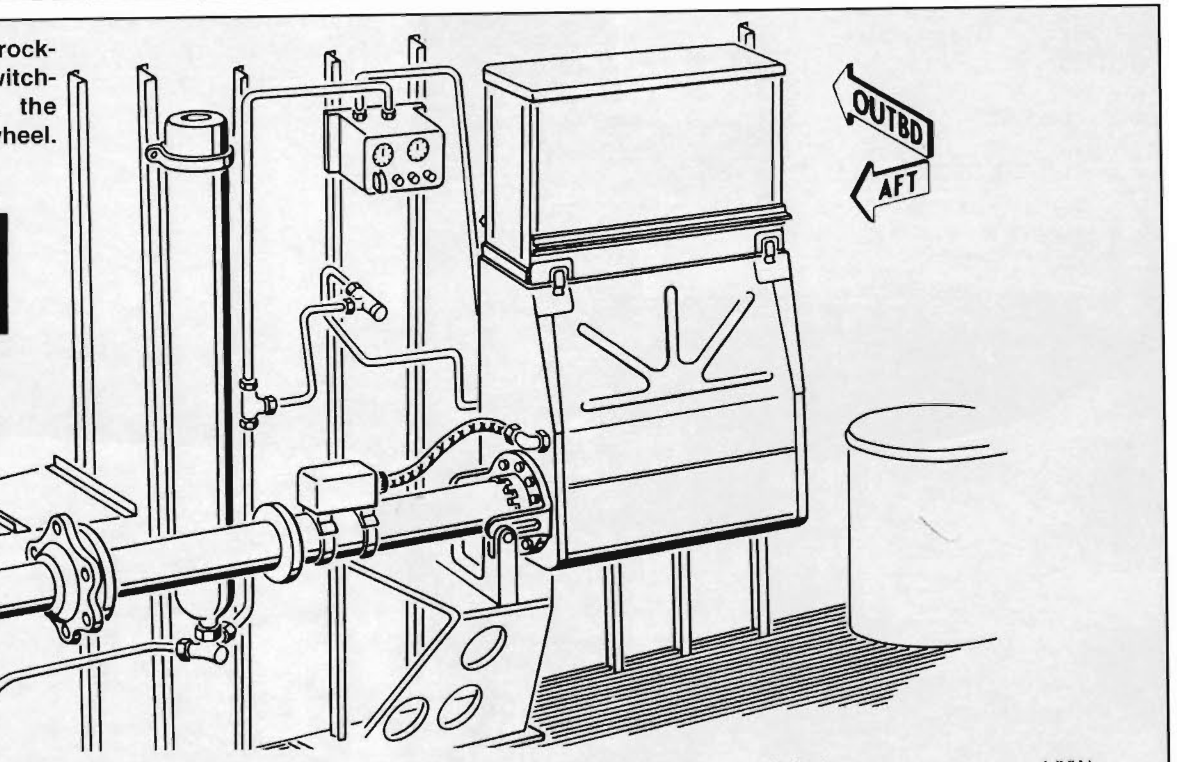






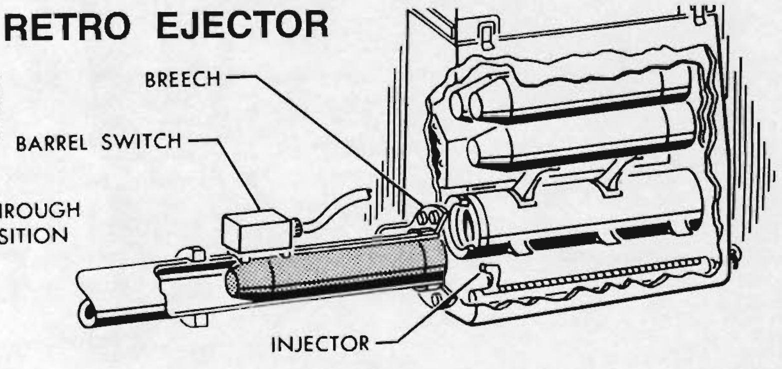
Above, loading wing rockets. Rocket release switches were located on the pilot's aileron control wheel. (National Archives)

WARNING:
DO NOT LOAD MAGAZINE WHEN AIR IS TURNED OFF

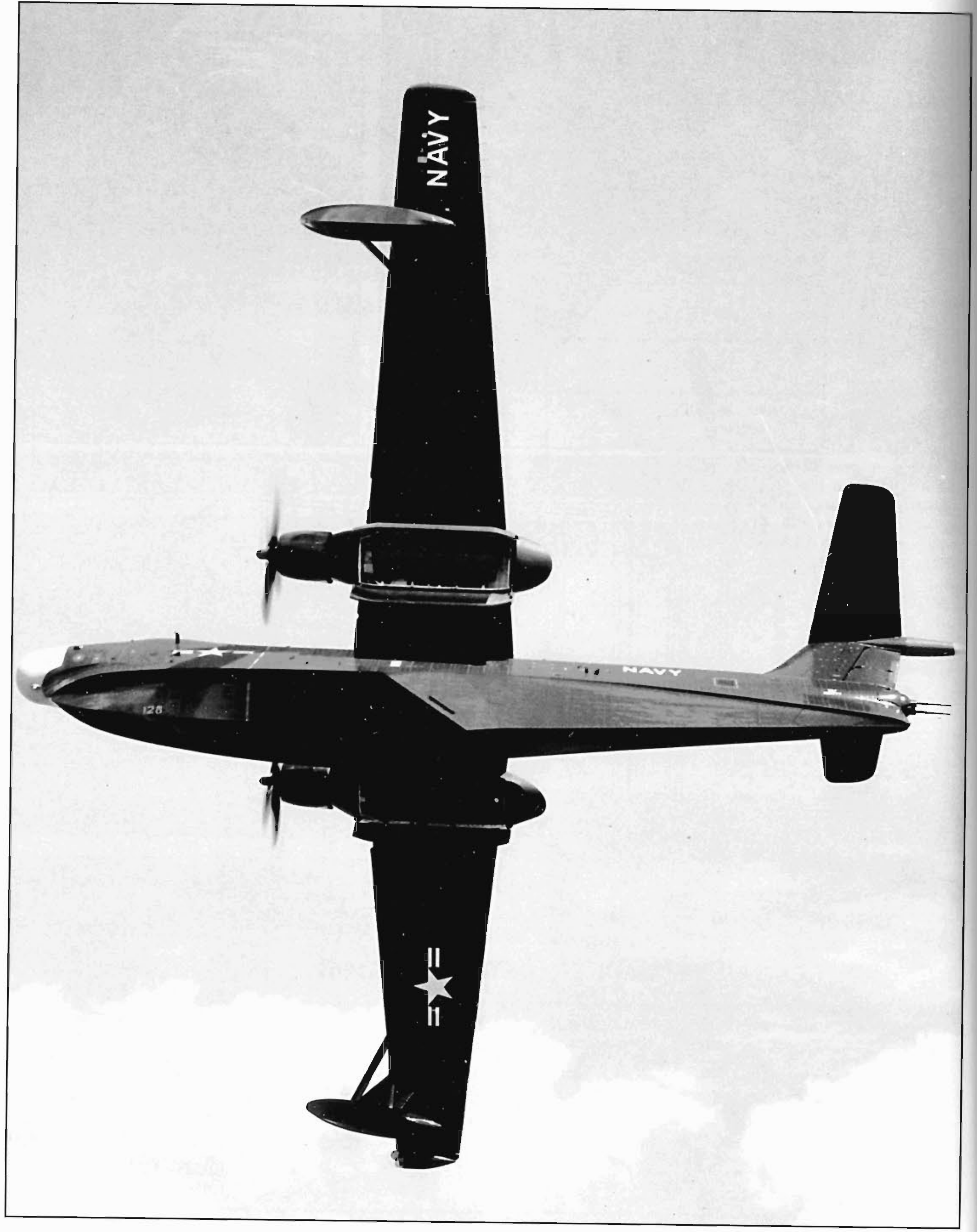


PNEUMATIC MARINE MARKER RETRO EJECTOR

The marine marker retroejector release system was located in the forward waist compartment on the left fuselage side. The ejector had 13 rounds and were fired aftward in the line of flight.

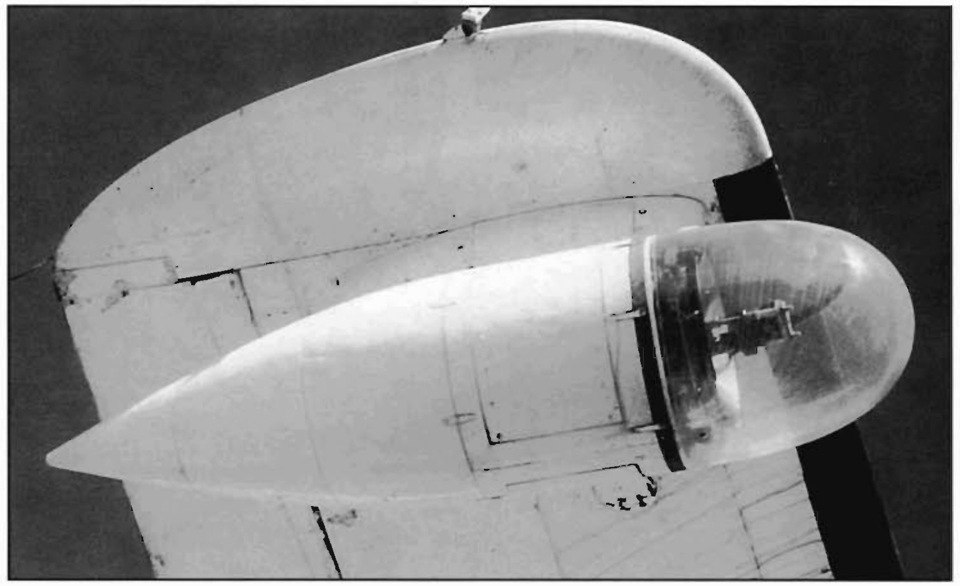

BREECH
BARREL SWITCH
INJECTOR DRIVES ROUND THROUGH BREECH TO "IN BARREL" POSITION
INJECTOR

Below, belly-view of early P5M-2 with open bomb bay doors shows contours of the improved hull design used on the -2 version. Note the aircraft has tail guns installed. (Martin)

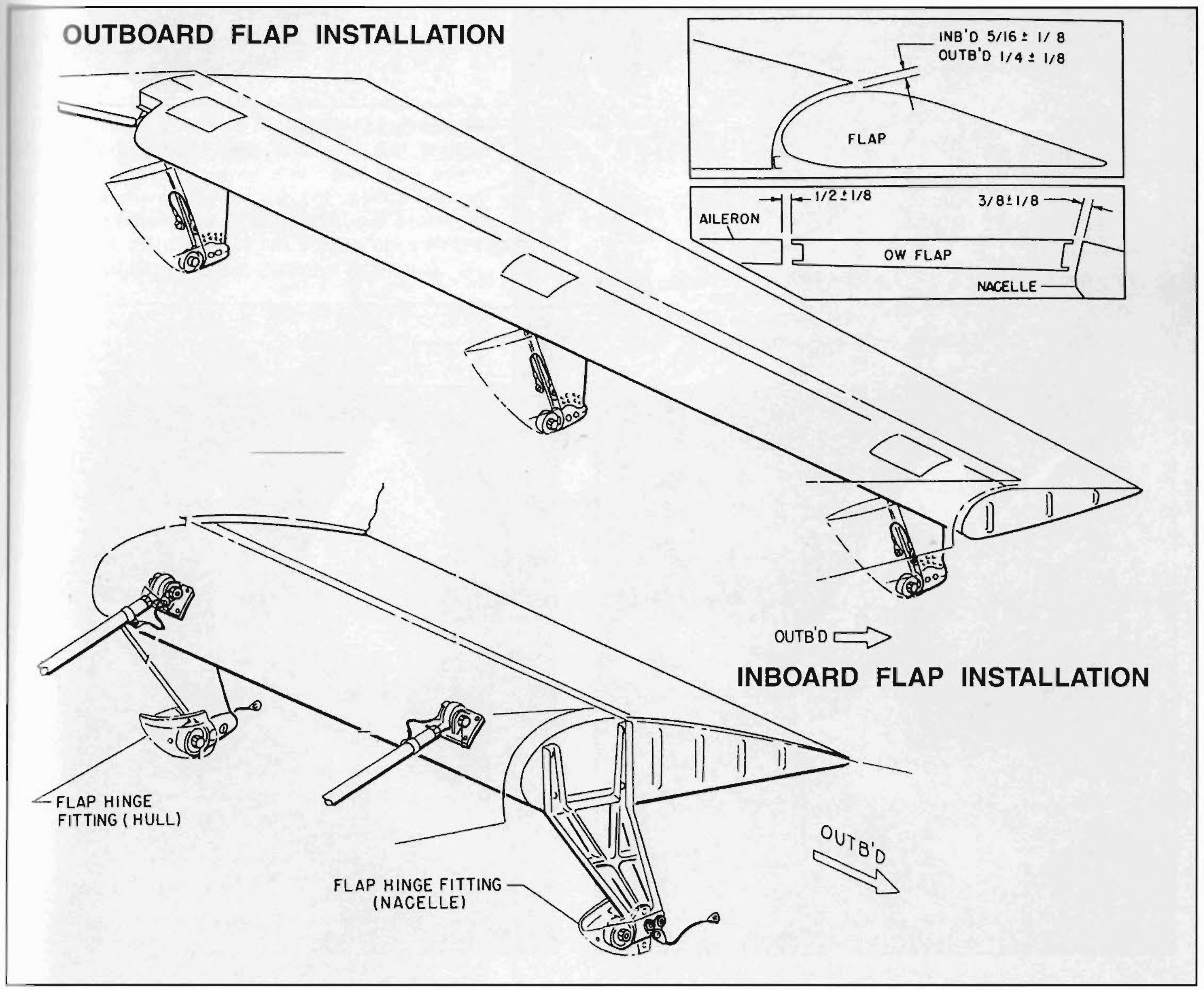

NAVY
NAVY
128

SEARCHLIGHT AN/AVQ-2A

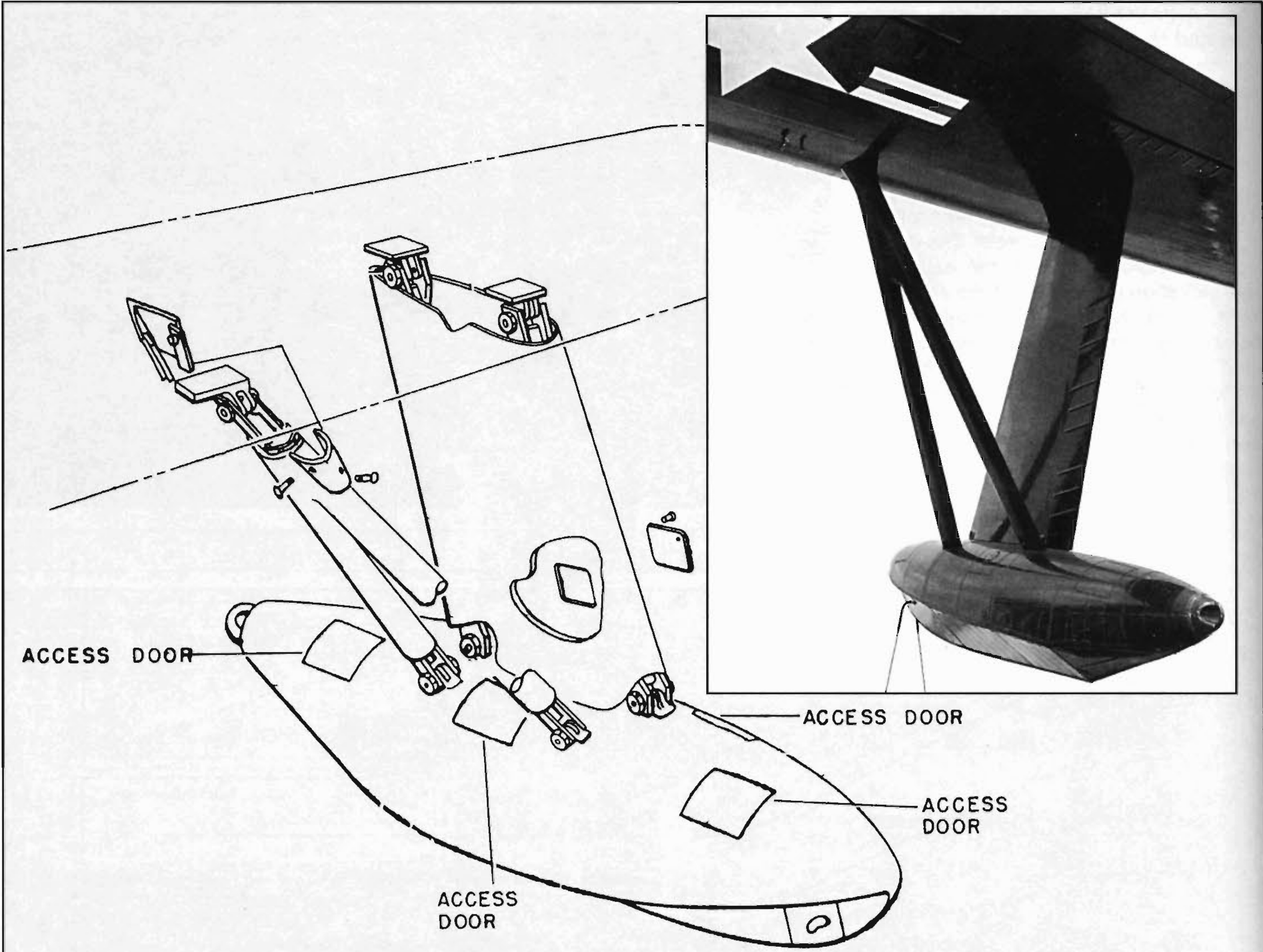
The AN/AVQ-2A searchlight was mounted to the underside of the right outer wing near the tip. The searchlight was for final target identification prior to bomb release. The light was a carbon arc light of 70,000,000 candle power mounted in a streamlined housing. Control of the searchlight was through a manually operated controller at the copilot's side console. The controller handle, swiveled for azimuth and elevation movement of the searchlight, contained a thumb-operated bomb release button and a finger-operated trigger switch to turn the light on. An indicator on the copilot's panel furnishes visual indication of the direction the light was aimed. The indicator was calibrated in degrees of azimuth and elevation.

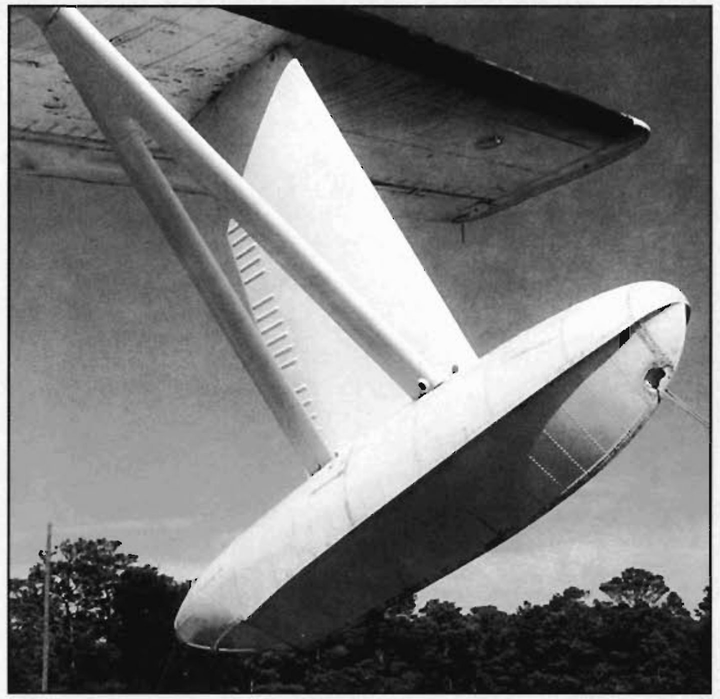


FLAPS


OUTBOARD FLAP INSTALLATION
INB'D 5/16 ± 1/8
OUTB'D 1/4 ± 1/8
FLAP
1/2 ± 1/8
3/8 ± 1/8
AILERON
OW FLAP
NACELLE
OUTB'D
INBOARD FLAP INSTALLATION
FLAP HINGE FITTING (HULL)
FLAP HINGE FITTING (NACELLE)
OUTB'D

WING MOUNTED FLOATS


ACCESS DOOR
ACCESS DOOR
ACCESS DOOR
ACCESS DOOR



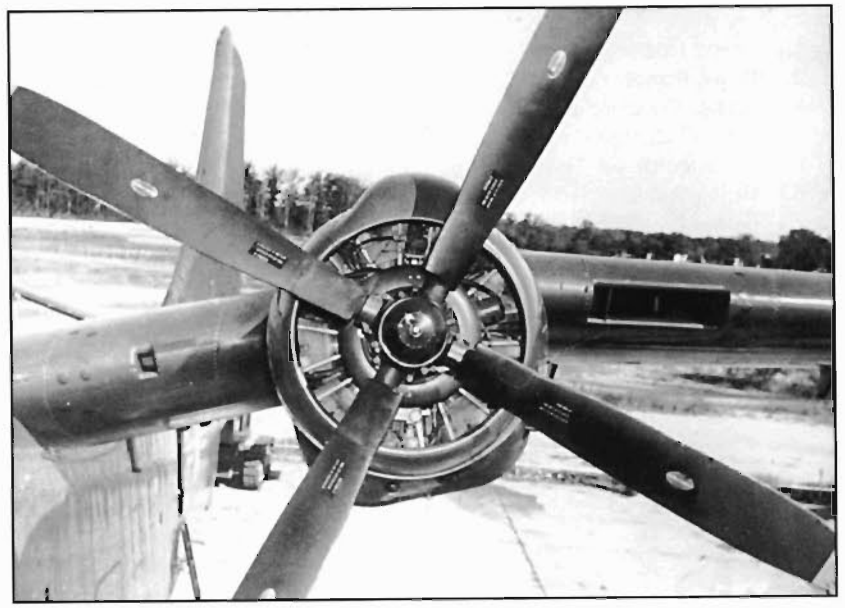
R-3350 ENGINE ASSEMBLIES

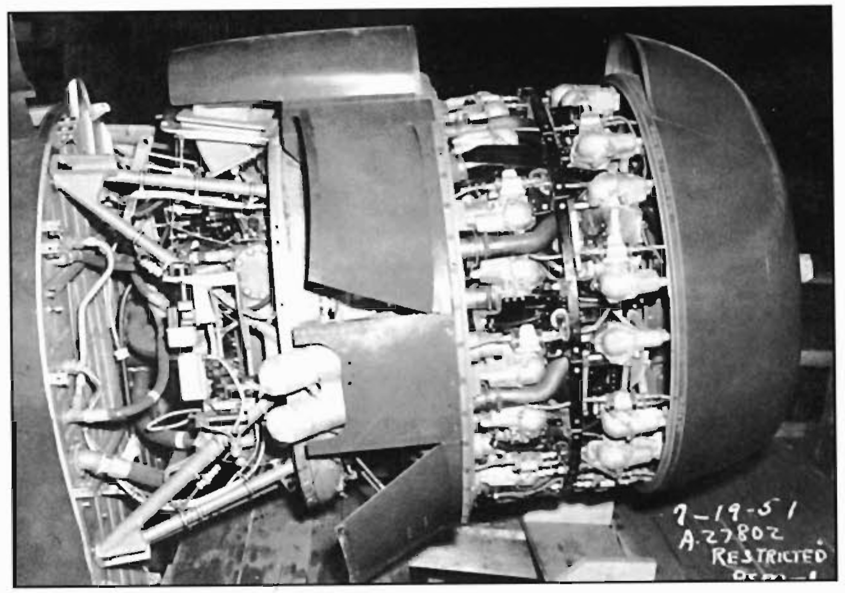
The P5M Marlin was powered by two Curtiss Wright R-3350 engines. Various versions were fitted over its operational life from the R-3350-30W through R-3350-36WA engine. The specifications below are for the R-3350-32WA engine.

Supercharger:	**one stage, two speed**
Reduction gear ratio:	**0.4375**
Propeller:	**4-blade Hamilton Standard**
Prop blade design #:	**A6925B-2**
Prop blade diameter:	**15.0 feet**

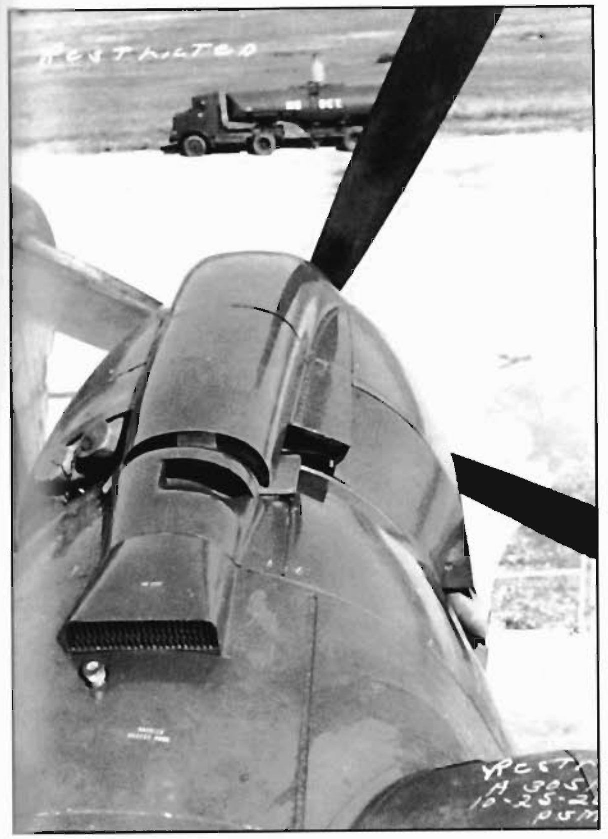
RATINGS

	BHP	RPM	ALT.
T.O.	3,700	2,900	S.L.
Military	3,400	2,900	S.L.
	3,420	2,900	2,400
	2,550	2,600	16,700
Normal	2,800	2,600	S.L.
	2,840	2,600	4,000
	2,450	2,600	17,700




7-19-51
A.27802
RESTRICTED

Above right, head-on view of the left engine on a P5M-1 in 1951. (National Archives) At right, right side of engine with cylinder cowls and engine accessory cowls removed and cowl flaps open. (National Archives) Below, view of upper cowls on the right engine of a P5M-1. (National Archives) Below right, right side of left engine on a P5M-1 with its cowl flaps closed. (National Archives)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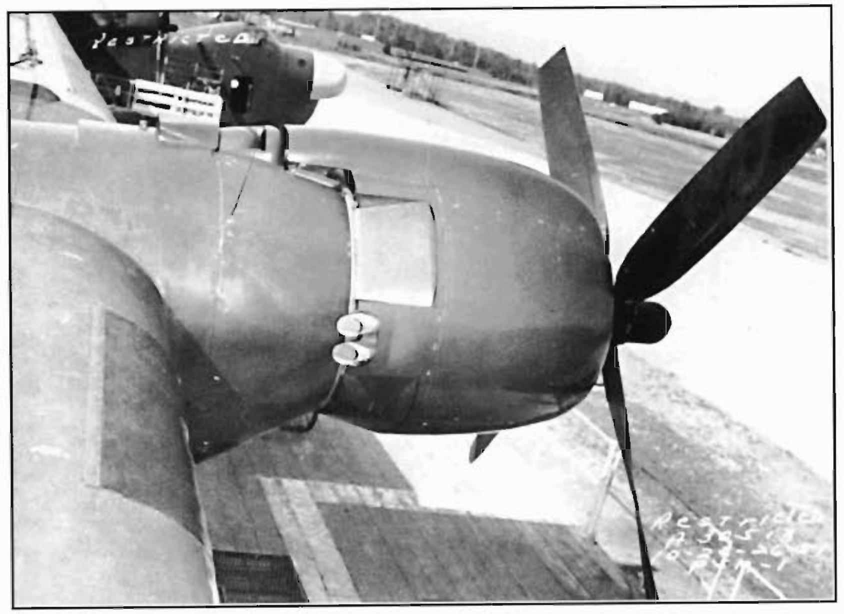
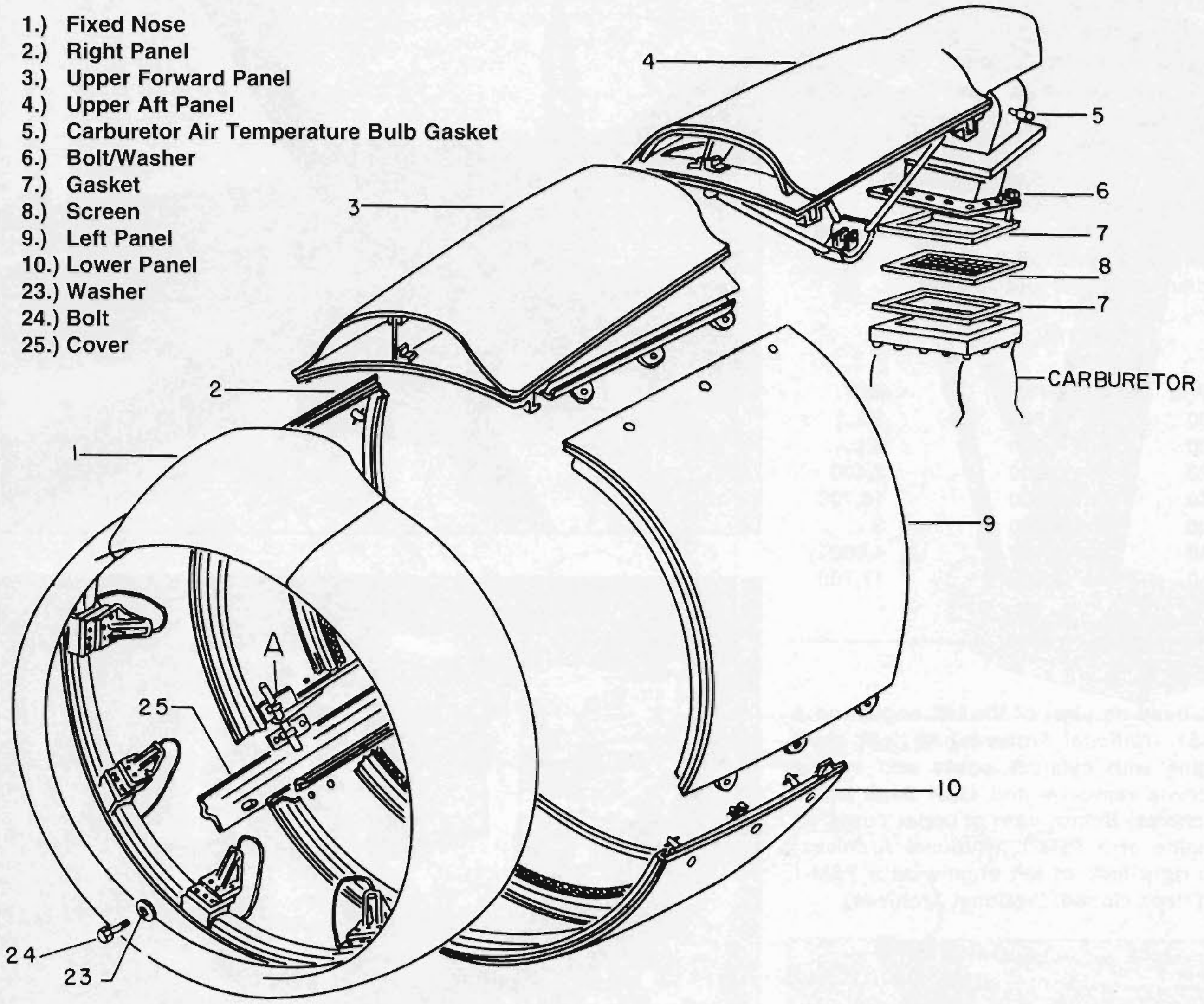
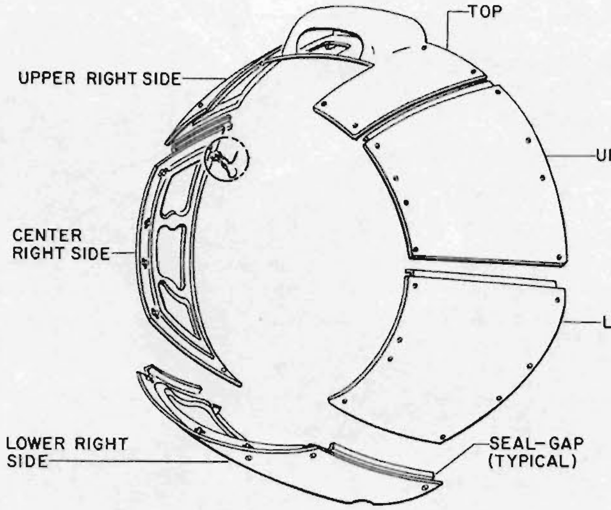

RESTRICTED

R-3350 ENGINE COWLINGS

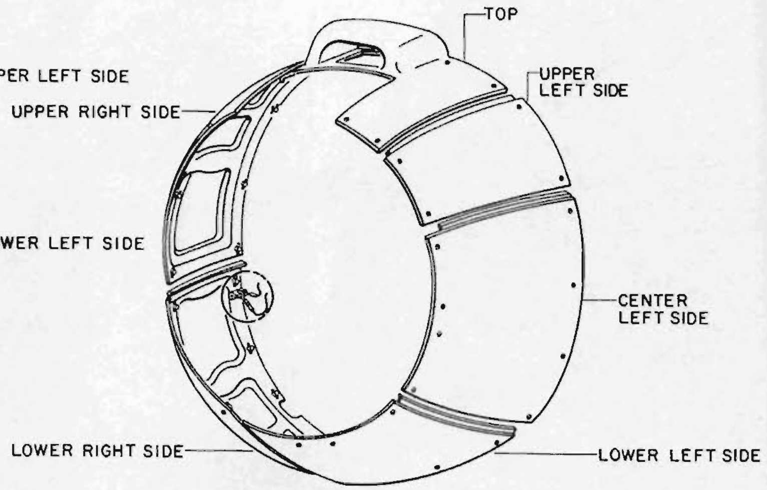
1.) Fixed Nose
2.) Right Panel
3.) Upper Forward Panel
4.) Upper Aft Panel
5.) Carburetor Air Temperature Bulb Gasket
6.) Bolt/Washer
7.) Gasket
8.) Screen
9.) Left Panel
10.) Lower Panel
23.) Washer
24.) Bolt
25.) Cover


4
5
3
6
7
8
7
CARBURETOR
2
1
9
A
25
10
24
23

LEFT ENGINE ACCESSORY COWLING

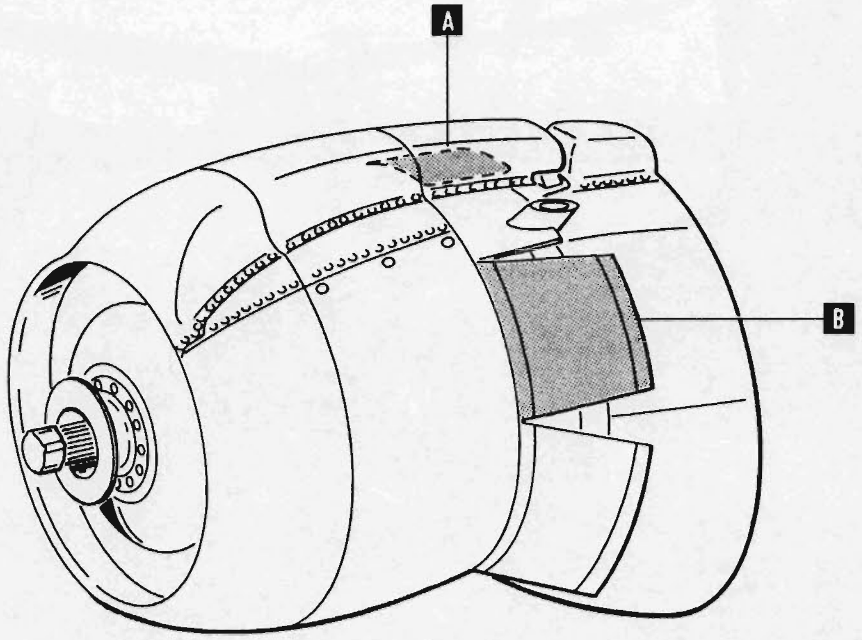

TOP
UPPER RIGHT SIDE
UPPER LEFT SIDE
CENTER RIGHT SIDE
LOWER LEFT SIDE
LOWER RIGHT SIDE
SEAL-GAP (TYPICAL)

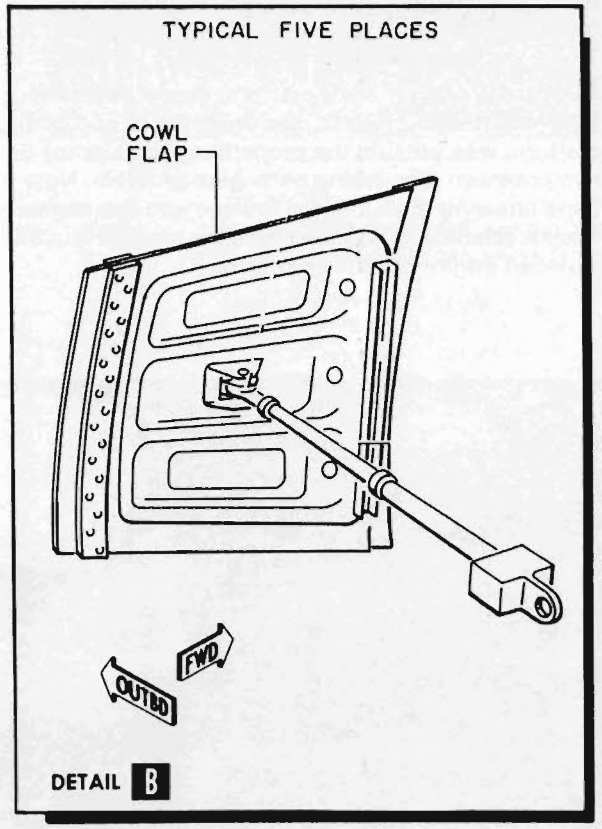
RIGHT ENGINE ACCESSORY COWLING

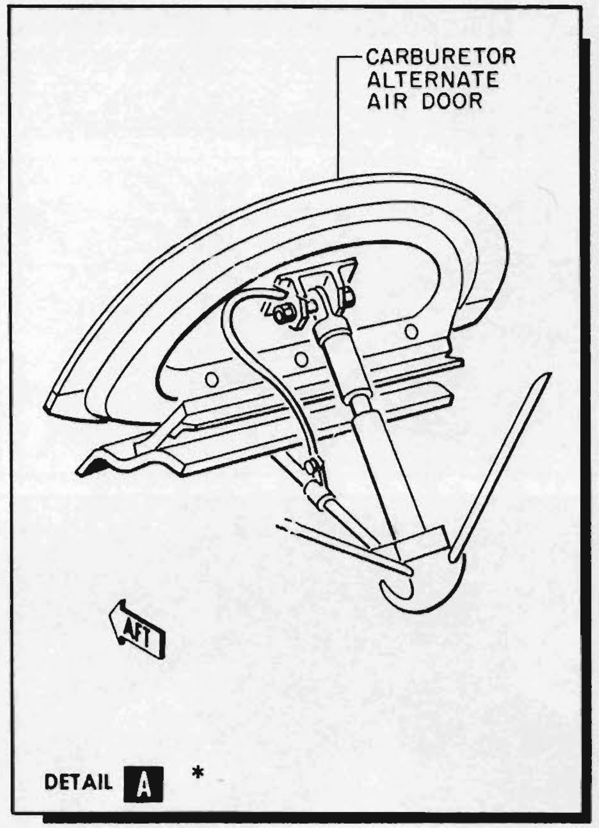

TOP
UPPER RIGHT SIDE
UPPER LEFT SIDE
CENTER LEFT SIDE
LOWER RIGHT SIDE
LOWER LEFT SIDE

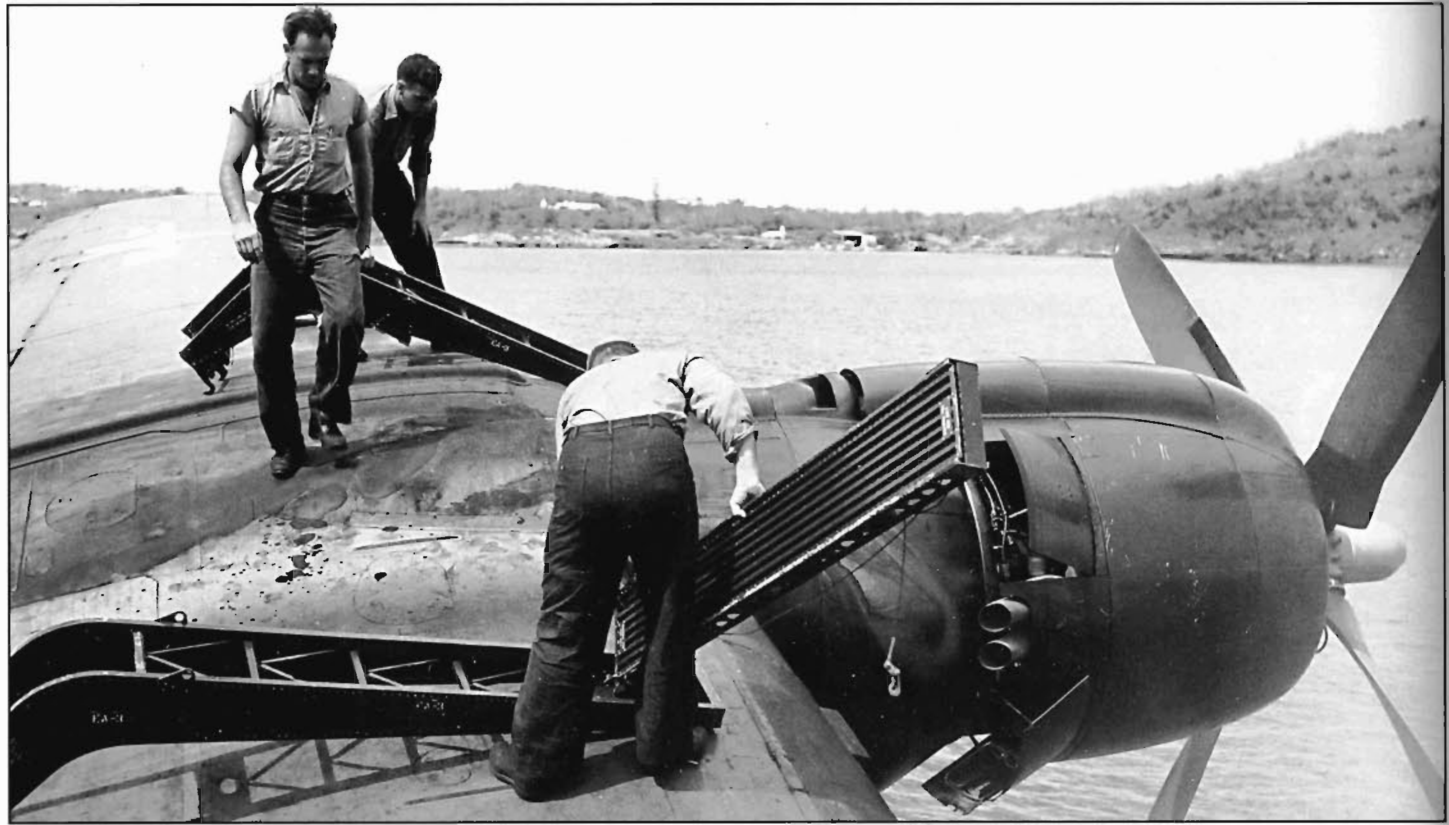
R-3350 COWL FLAPS & CARBURETOR ALTERNATE AIR DOOR MECHANISM

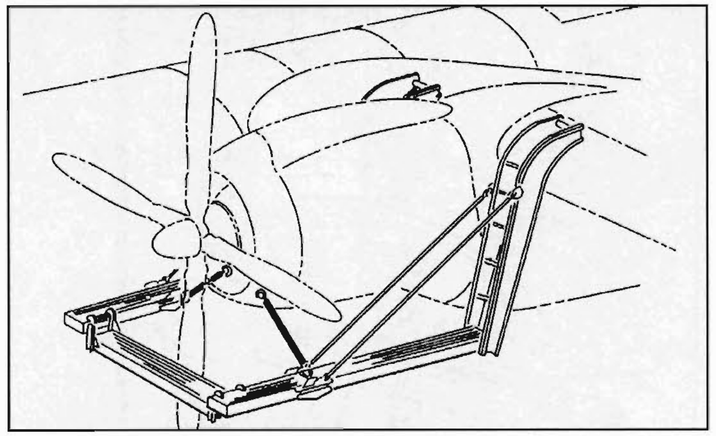
(TYPICAL LH AND RH NACELLE)



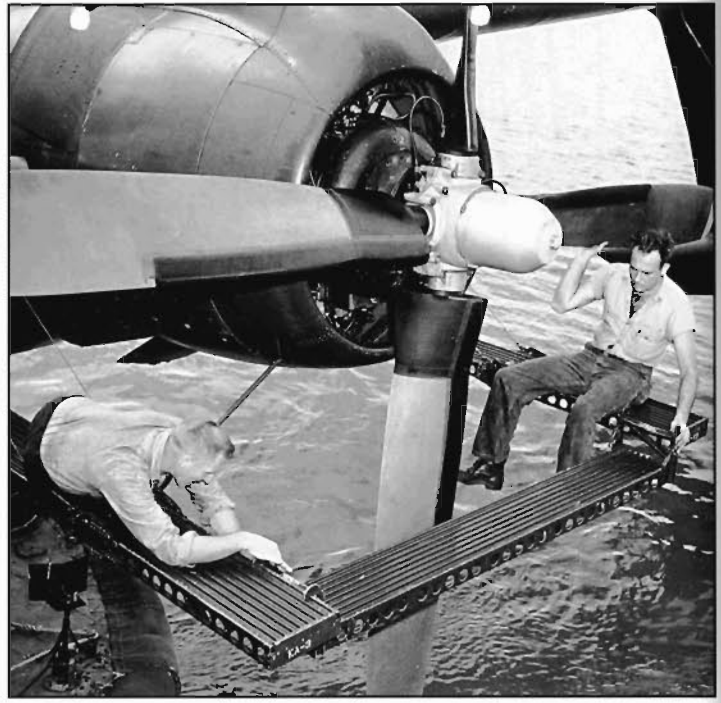

TYPICAL FIVE PLACES
COWL FLAP
OUTBD
FWD
DETAIL B

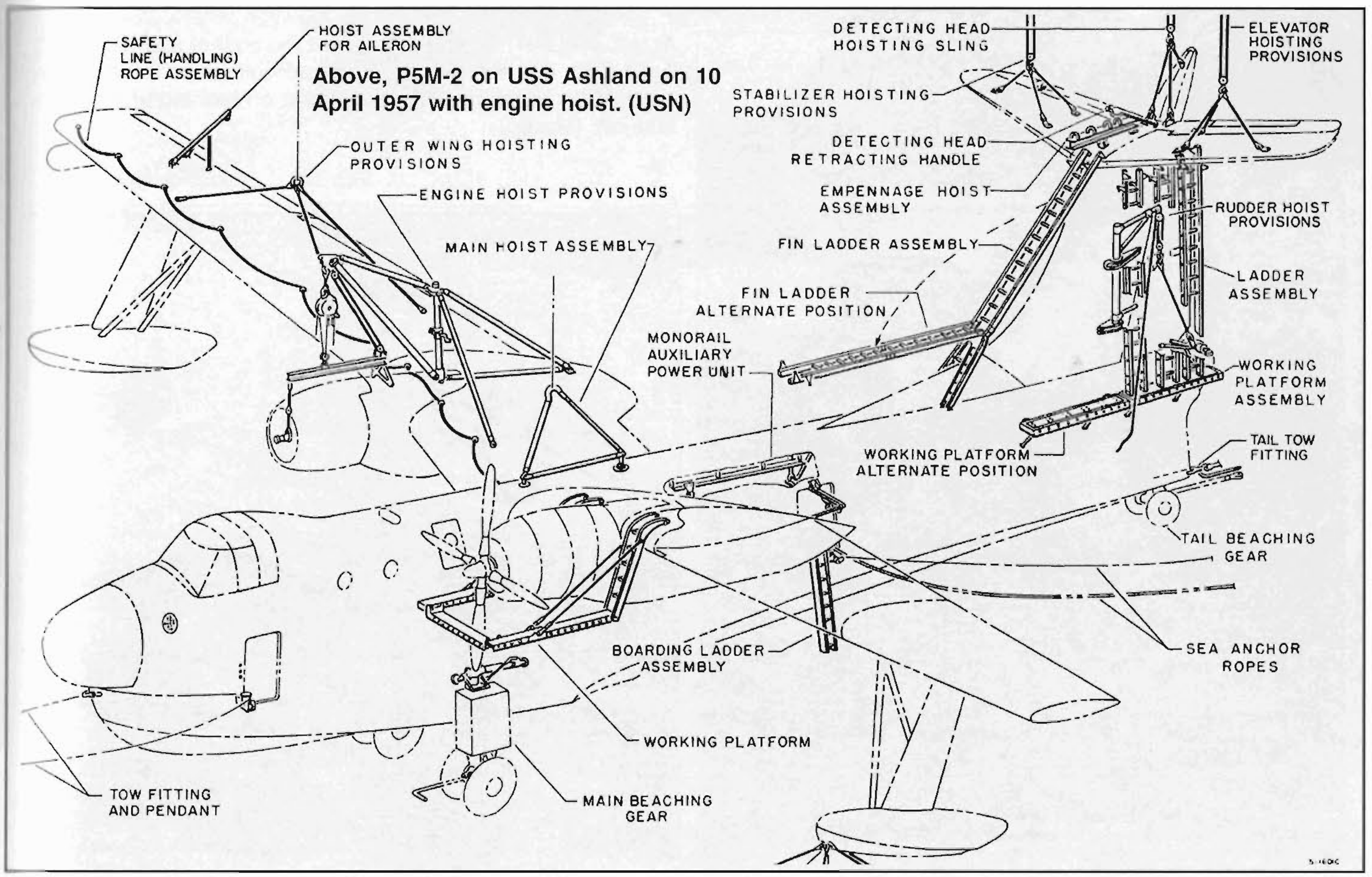

CARBURETOR ALTERNATE AIR DOOR
AFT
DETAIL A
*





Above, the engine work platform being assembled while the P5M is at anchor. (Martin) Below, forward end of engine work platform was outside the propellers arc. (Martin) Below right, two crewmen discussing an engine problem. Note open cowl flaps showing their internal linkage and the engine's exhaust stacks. (Martin) At left, maintenance manual illustration of the installed engine working platform.

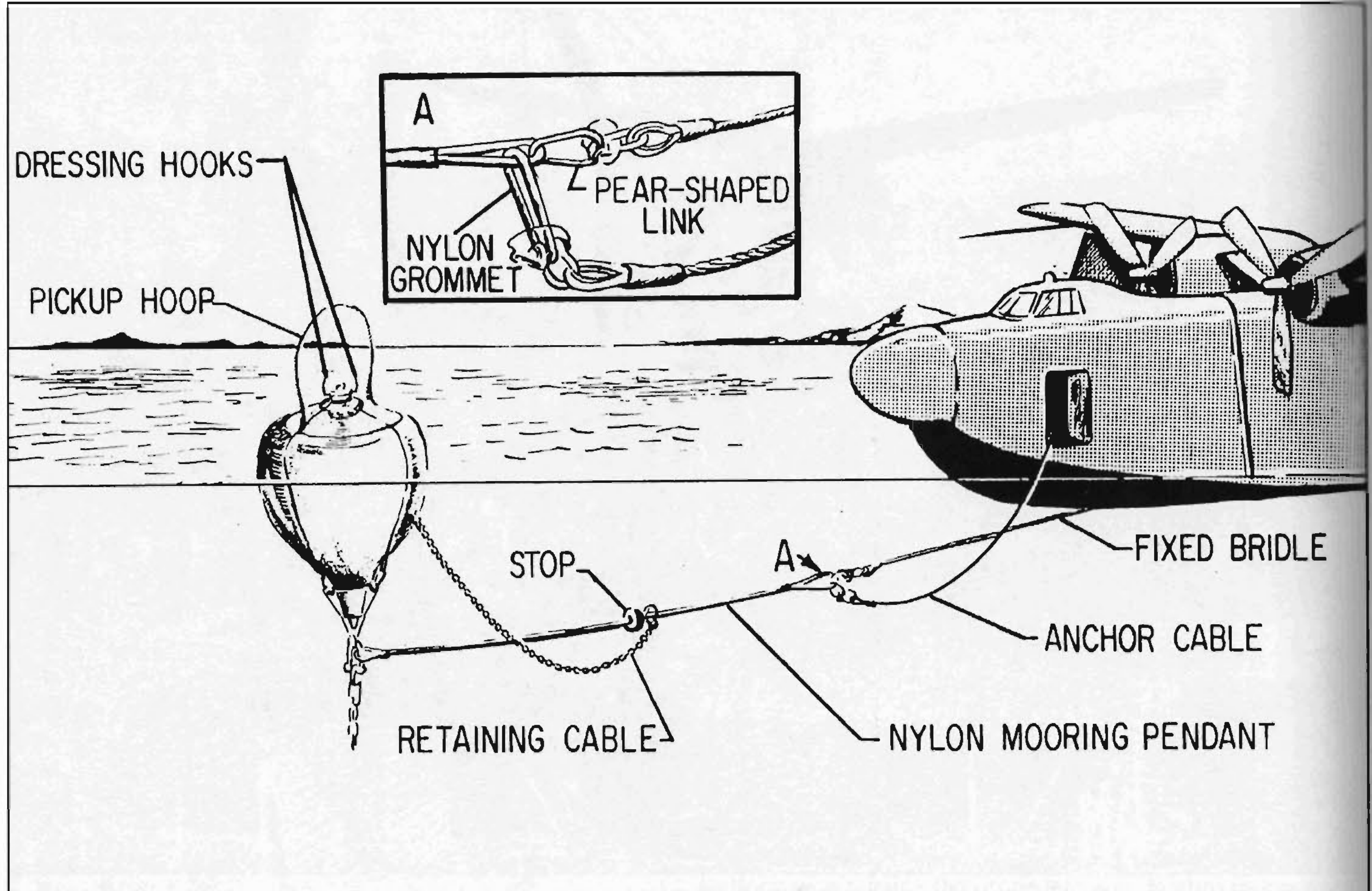


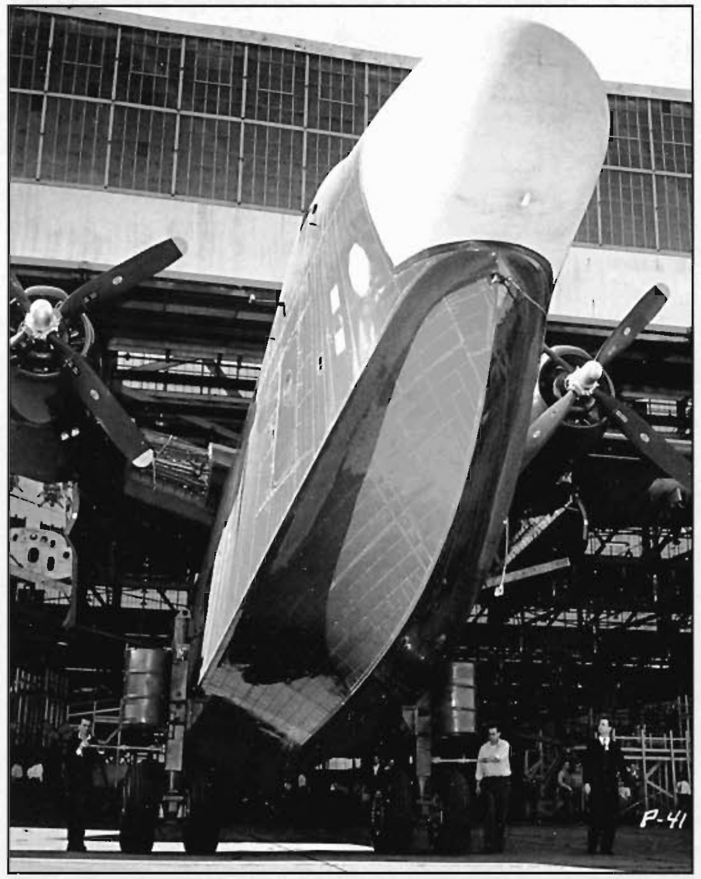


Above, P5M-2 on USS Ashland on 10 April 1957 with engine hoist. (USN)

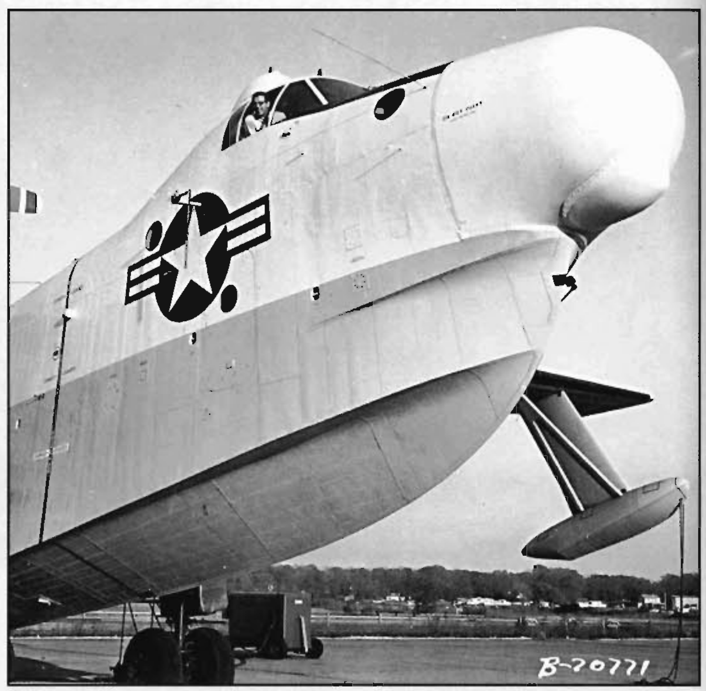
SAFETY LINE (HANDLING) ROPE ASSEMBLY
HOIST ASSEMBLY FOR AILERON
OUTER WING HOISTING PROVISIONS
ENGINE HOIST PROVISIONS
MAIN HOIST ASSEMBLY
DETECTING HEAD HOISTING SLING
STABILIZER HOISTING PROVISIONS
DETECTING HEAD RETRACTING HANDLE
EMPENNAGE HOIST ASSEMBLY
FIN LADDER ASSEMBLY
FIN LADDER ALTERNATE POSITION
MONORAIL AUXILIARY POWER UNIT
ELEVATOR HOISTING PROVISIONS
RUDDER HOIST PROVISIONS
LADDER ASSEMBLY
WORKING PLATFORM ASSEMBLY
WORKING PLATFORM ALTERNATE POSITION
TAIL TOW FITTING
TAIL BEACHING GEAR
SEA ANCHOR ROPES
BOARDING LADDER ASSEMBLY
WORKING PLATFORM
MAIN BEACHING GEAR
TOW FITTING AND PENDANT

BOW AND MOORING


A
DRESSING HOOKS
PEAR-SHAPED LINK
NYLON GROMMET
PICKUP HOOP
STOP
A
FIXED BRIDLE
ANCHOR CABLE
RETAINING CABLE
NYLON MOORING PENDANT



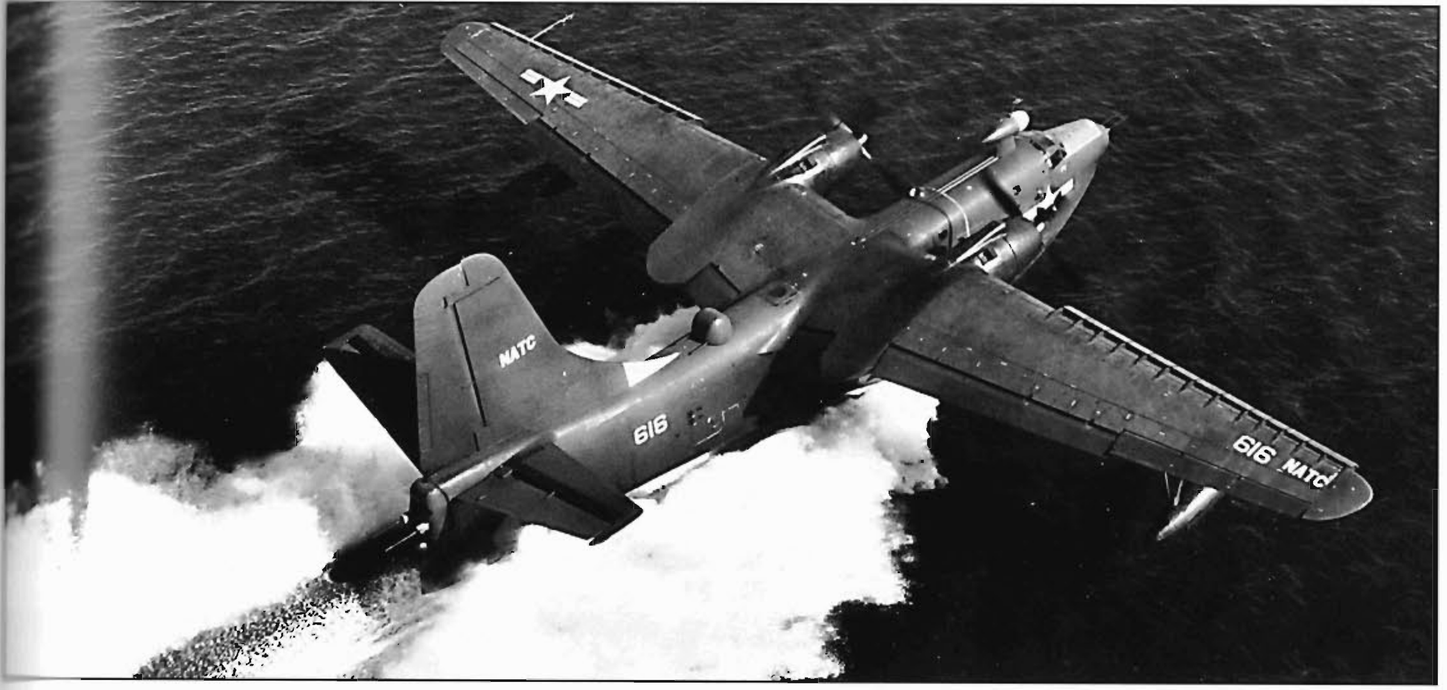
At left, original hull shape used on the bow of a P5M-1 on 20 April 1953. (Martin) Below, improved hull shape used on latter P5M-2s enhanced water handling on landing and during take-off. (Martin)

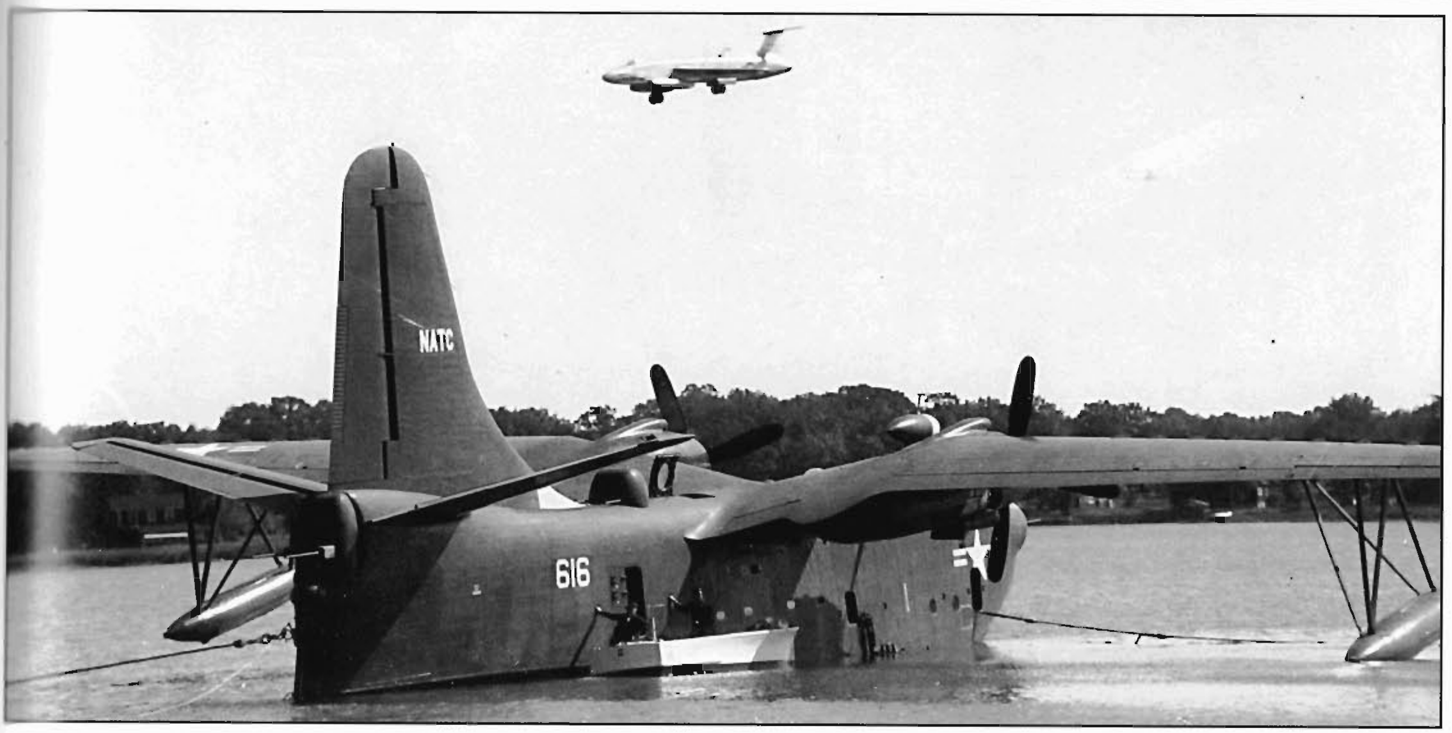


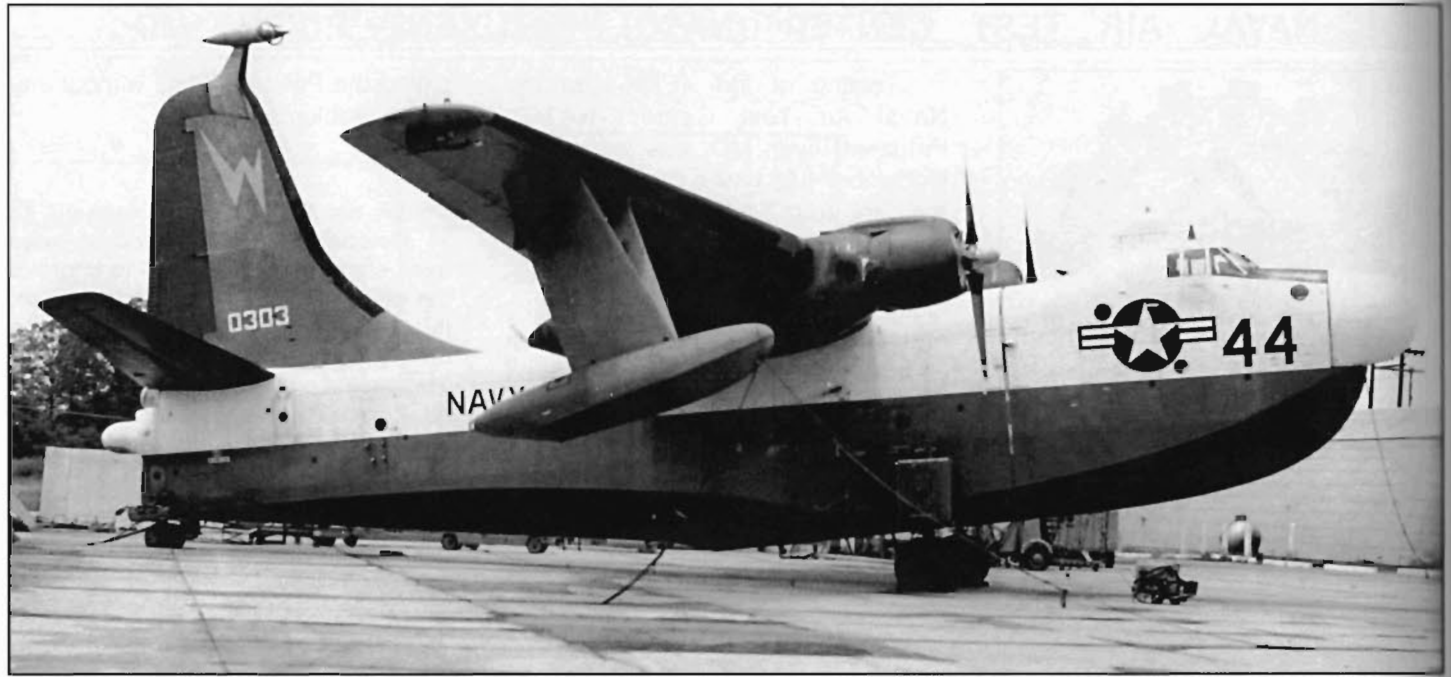
NAVAL AIR TEST CENTER (NATC), PATUXENT RIVER, MD

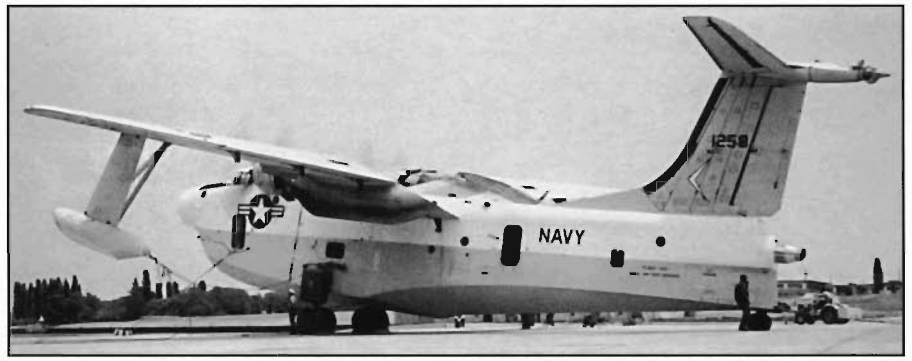
Testing of the XP5M-1 at the Naval Air Test Center (NATC), Patuxent River, MD, was followed In December 1951 with the delivery of the first four Marlins for extensive acceptance tests and trials. The aircraft were examined for Flying Qualities and Performance (FQ&P) and checked to see that they met contract guarantees for weight, speed and climb. Thanks to the research and development flights on the XP5M-1, the production P5M-1s completed the Patuxent tests without any major problems.

Below, the XP5M-1 during take-off on 11 October 1950. Note leading edge fixed slats that were added to improve the original PBM wings performance. (Martin) Bottom, the XP5M-1 moored off the Martin seaplane ramp as an XB-51 passes overhead. Aircraft had FT for Flight Test on the nose, and 616 and NATC on the wing and fuselage. (Martin)

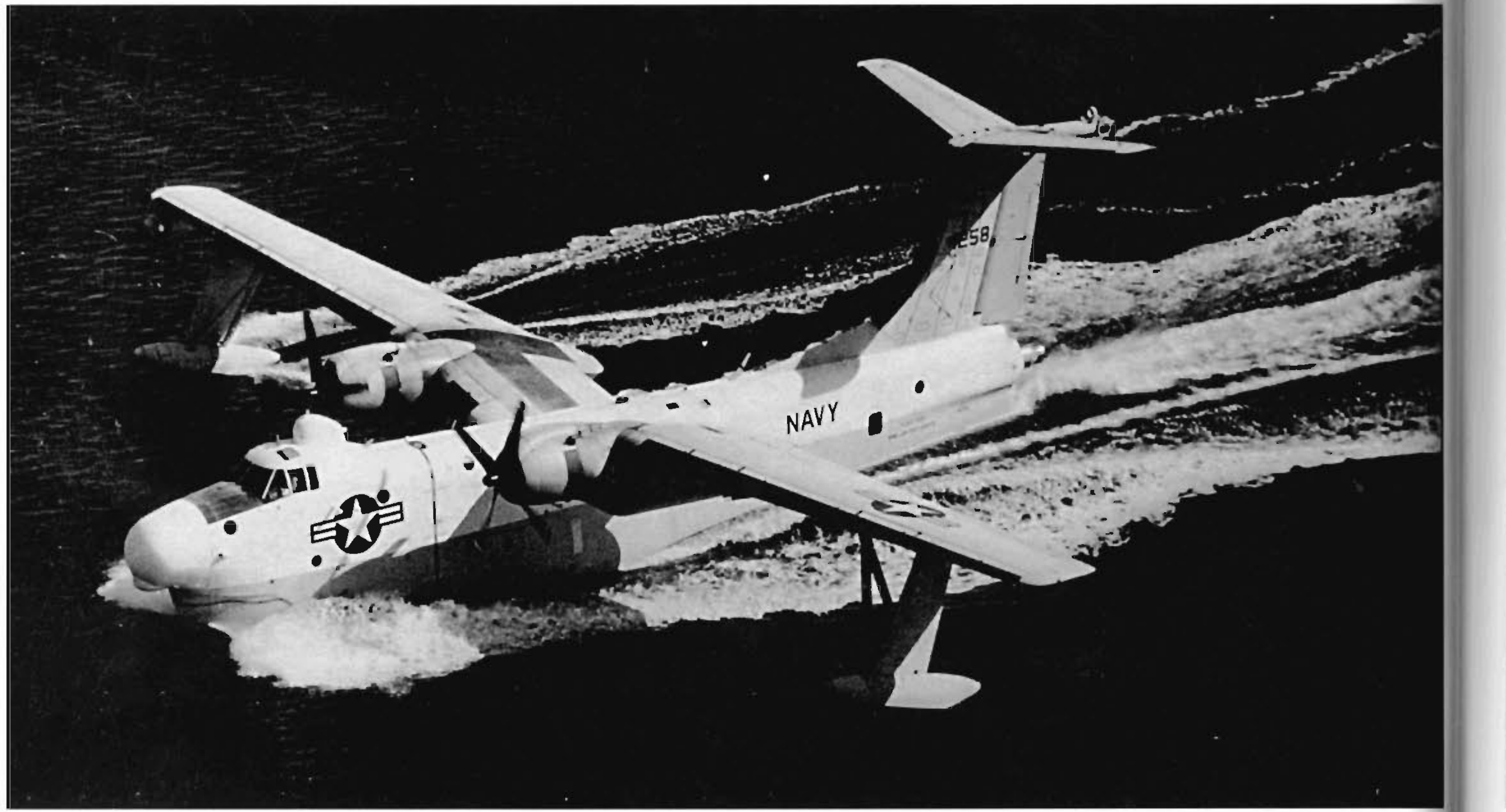








Above, Naval Air Test Center Weapons Test P5M-1 BuNo 130303 in 1963. The author flew this aircraft over 100 hours during the testing of an improved electrical system. (NMNA) Below and at left, SP-5B BuNo 1258 with NATC painted on the tail was the test aircraft for a jet engine mounted in the tail gunner's position which was intended to improve the Marlin's take-off performance. Flight Test Naval Air Test Center was painted on the lower rear fuselage. (NMNA)



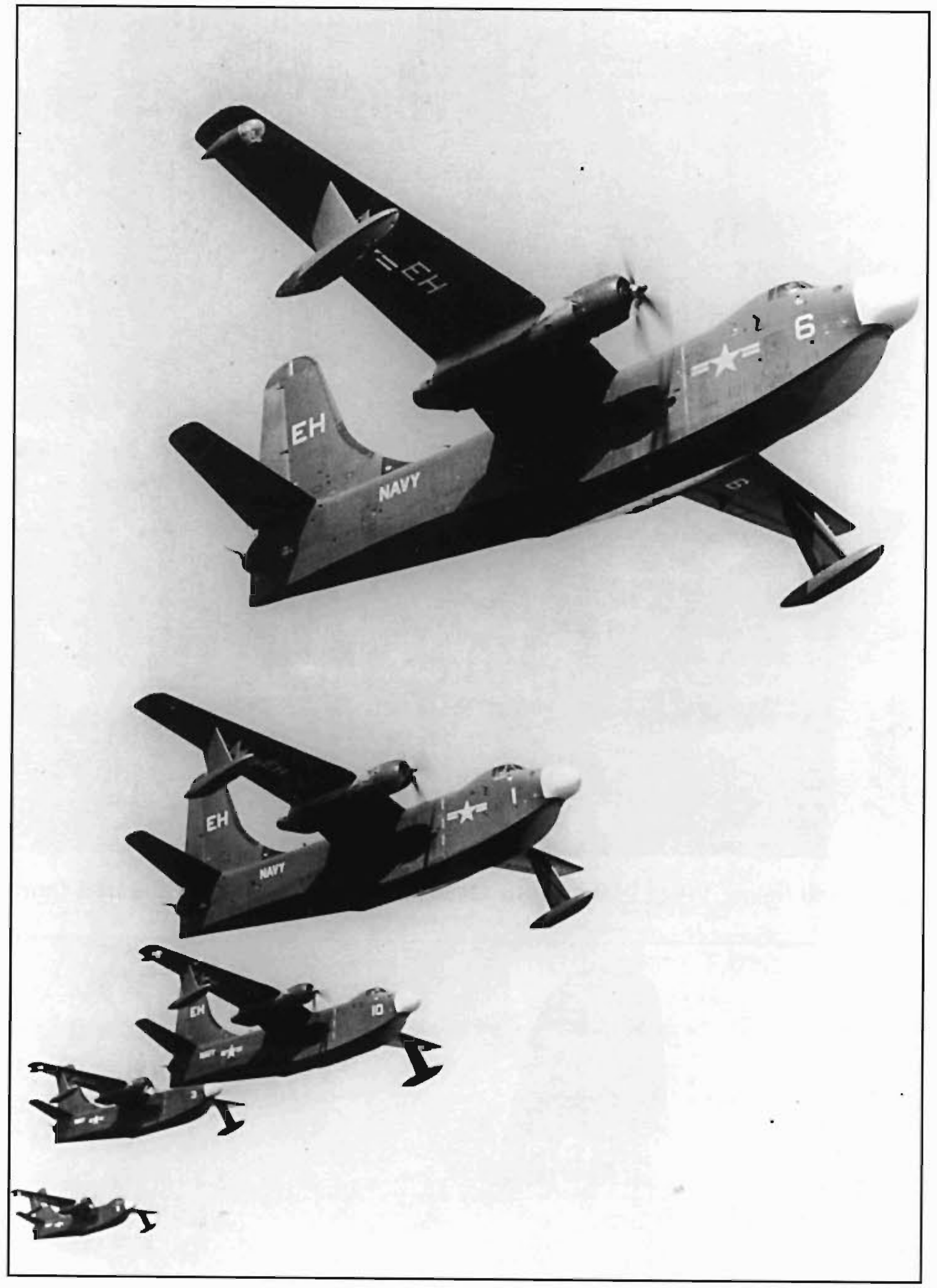
MARLIN SQUADRON OPERATIONS 1952-1967

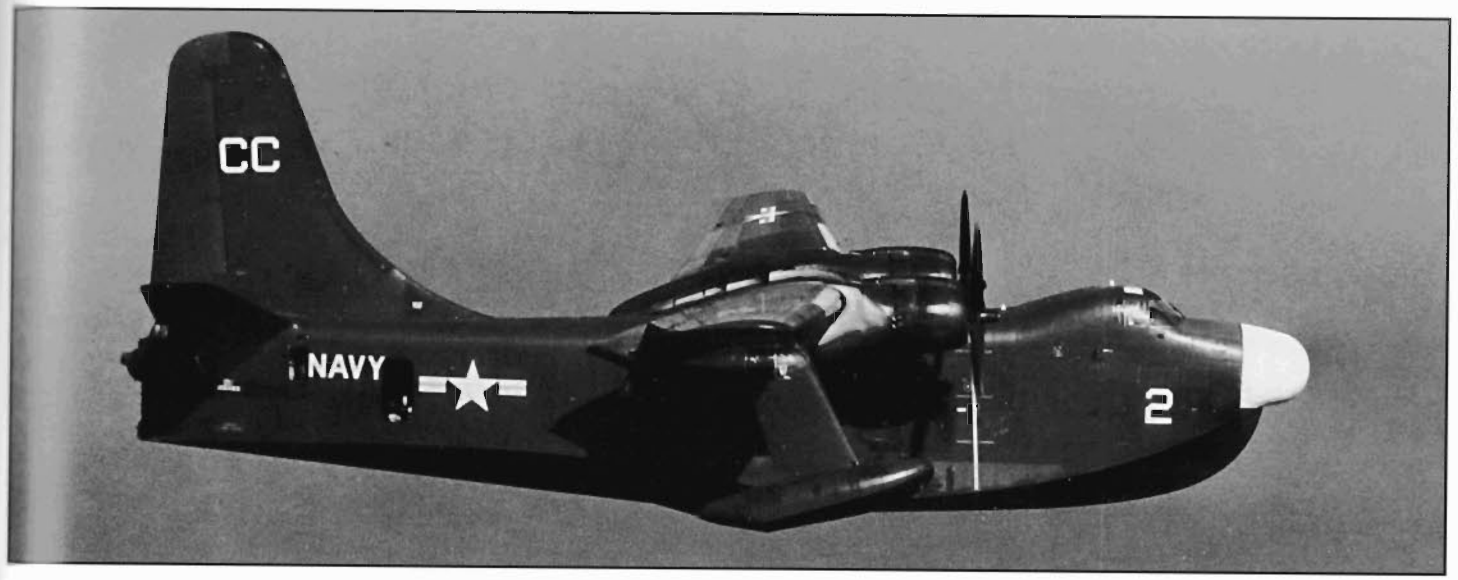
Although the mission of the Marlin was the same in both the Atlantic and Pacific Fleets, its deployment and employment, because of geography and strategic considerations, was somewhat different. Therefore, Marlin squadron operations and employment are grouped by the fleets in which they served.

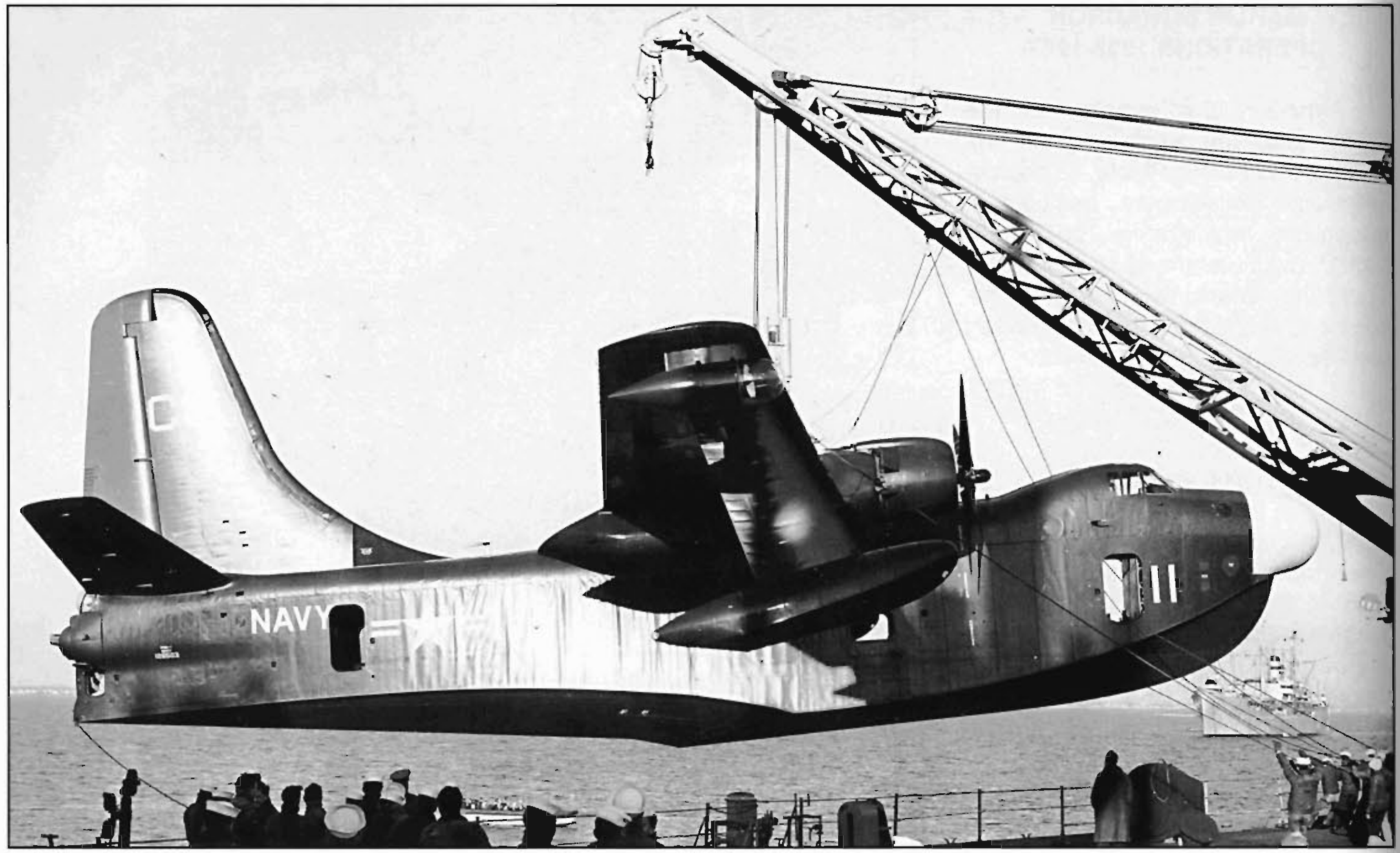
ATLANTIC FLEET, 1952-1964

1952-53: Delivery of the production P5M-1s to the Atlantic Fleet began in April 1952. On 23 April 1952, Patrol Squadron 44 (VP-44), based at Norfolk, became the first squadron to receive the new Marlin. VP-49, based in Bermuda, received its Marlins on 2 September 1952, and VP-56, also based in Norfolk, officially transitioned to the Marlin in May 1953. The three squadrons then engaged in extensive aircraft familiarization and ASW training exercises. The first Marlin crash occurred on 13 July 1953 when VP-44's BuNo 126503, flying out of Norfolk on an ASW exercise, lost power and was forced to attempt a landing in the open-sea. Seven crewmen were lost.

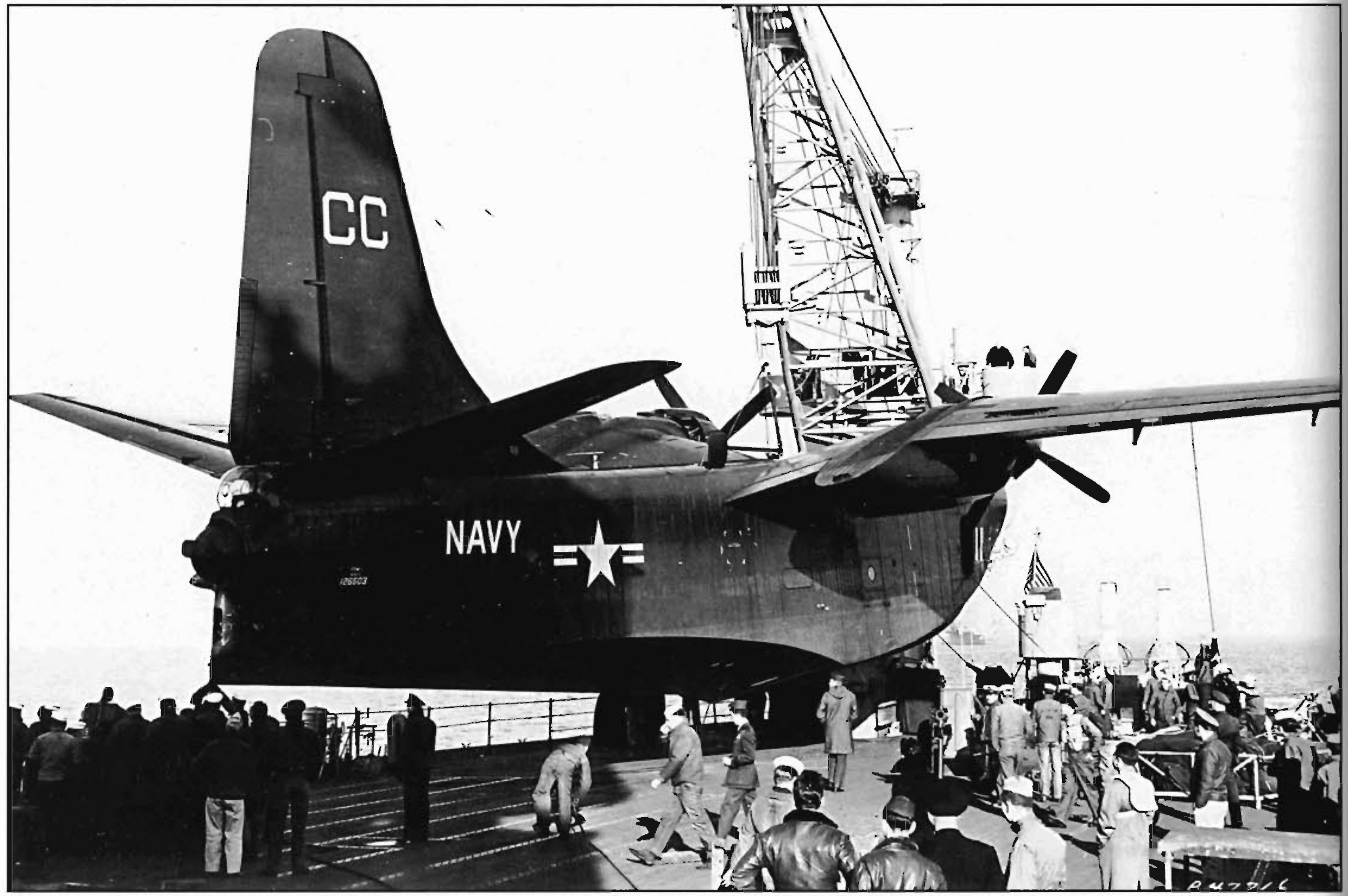
At right, VP-56 was one of the first three Atlantic Fleet P5M squadrons. (USN) Below, VP-44 was the first Atlantic Fleet Marlin squadron. BuNo 126493 over the Norfolk area in 1952. (USN)







Above and Below, VP-44 P5M-1 BuNo 126503 being hoisted aboard the USS Currituck (AV-7) on 29 December 1952. (USN)

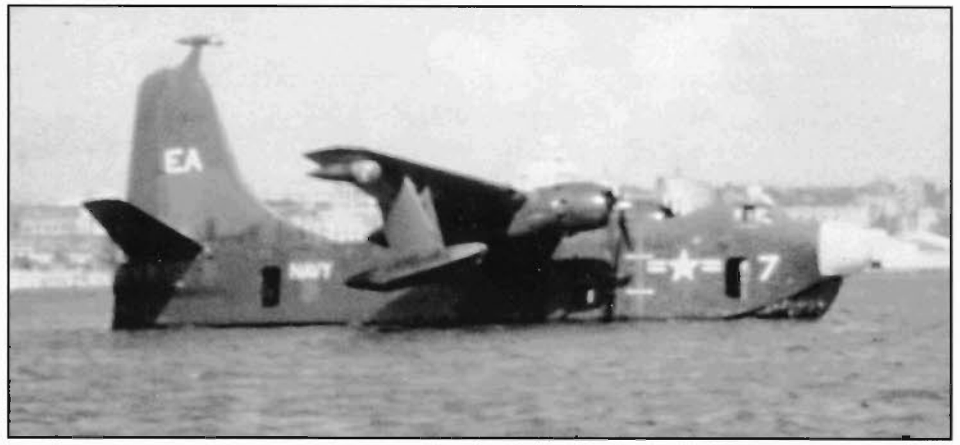


Patrol Squadron
Forty Four

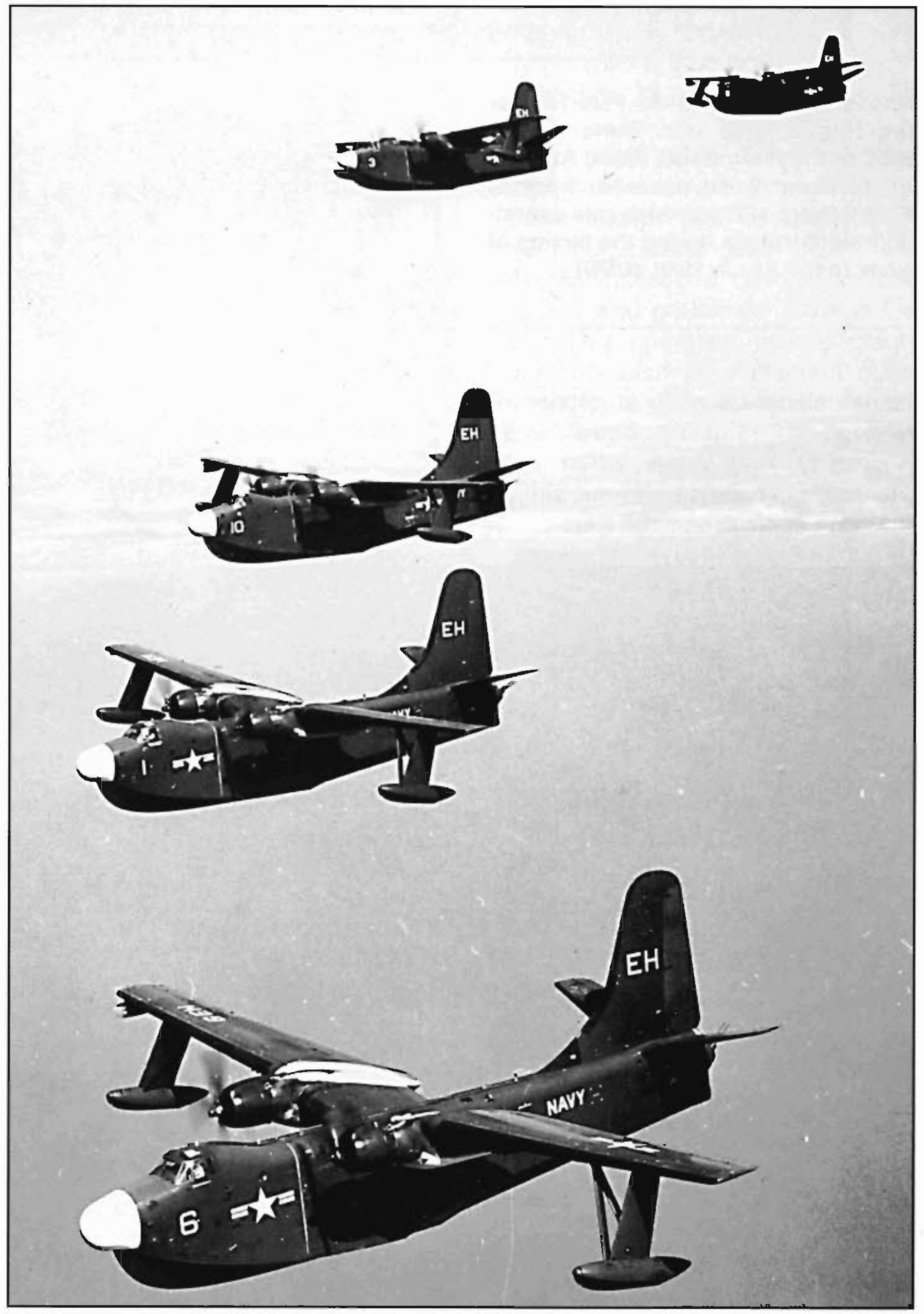
1954: VP-45, based at Coco Solo, Canal Zone, was transitioned from the Mariner in April 1954. All four of the Atlantic Fleet seaplane squadrons were now equipped with Marlins. In April and May 1954, VP-49 operated with the large seaplane tender *Currituck* in Bermuda and VP-45 with the small seaplane tender *Timbalier* in the Caribbean. In July 1954, VP-44 deployed to Pembroke Dock, Milford Haven, Wales, by way of Argentia, Newfoundland for 15 days of operations supported by *Currituck*. Then in August, *Currituck* and the squadron moved from the United Kingdom to the Mediterranean, operating from Taranto, Italy, for further exercises, returning to Norfolk on 6 September 1954.

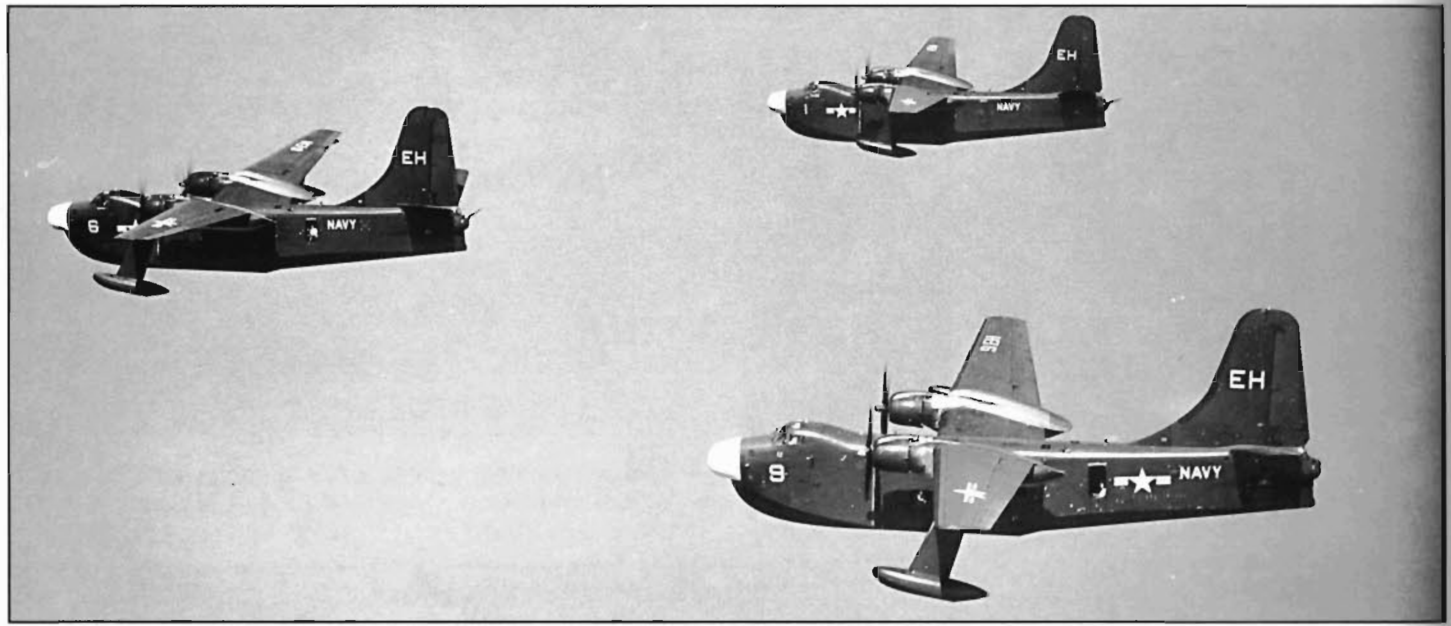
1955: VP-56 suffered its first Marlin loss on 9 April 1955. During a night take-off, the pilot became disoriented and crashed into the NAS Norfolk seawall. Four crewmen were lost. During this year, VP-49 widely deployed its aircraft throughout the Atlantic Fleet training areas including Norfolk, to Pillsbury Sound in the Virgin Islands, and to San Juan, Puerto Rico, for the annual "Operation Springboard" training exercises. VP-45 deployed from Panama to NAS Corpus Christi, TX, to support "Operation NARMID 55", a summer aviation training session for 1200 NROTC midshipmen from 52 colleges and universities.

1956: In January 1956, the submarine oiler USS *Guavina* (AOSS-362), began testing the viability of mobile support of seaplanes from a submarine. *Guavina* was able to refuel sea-

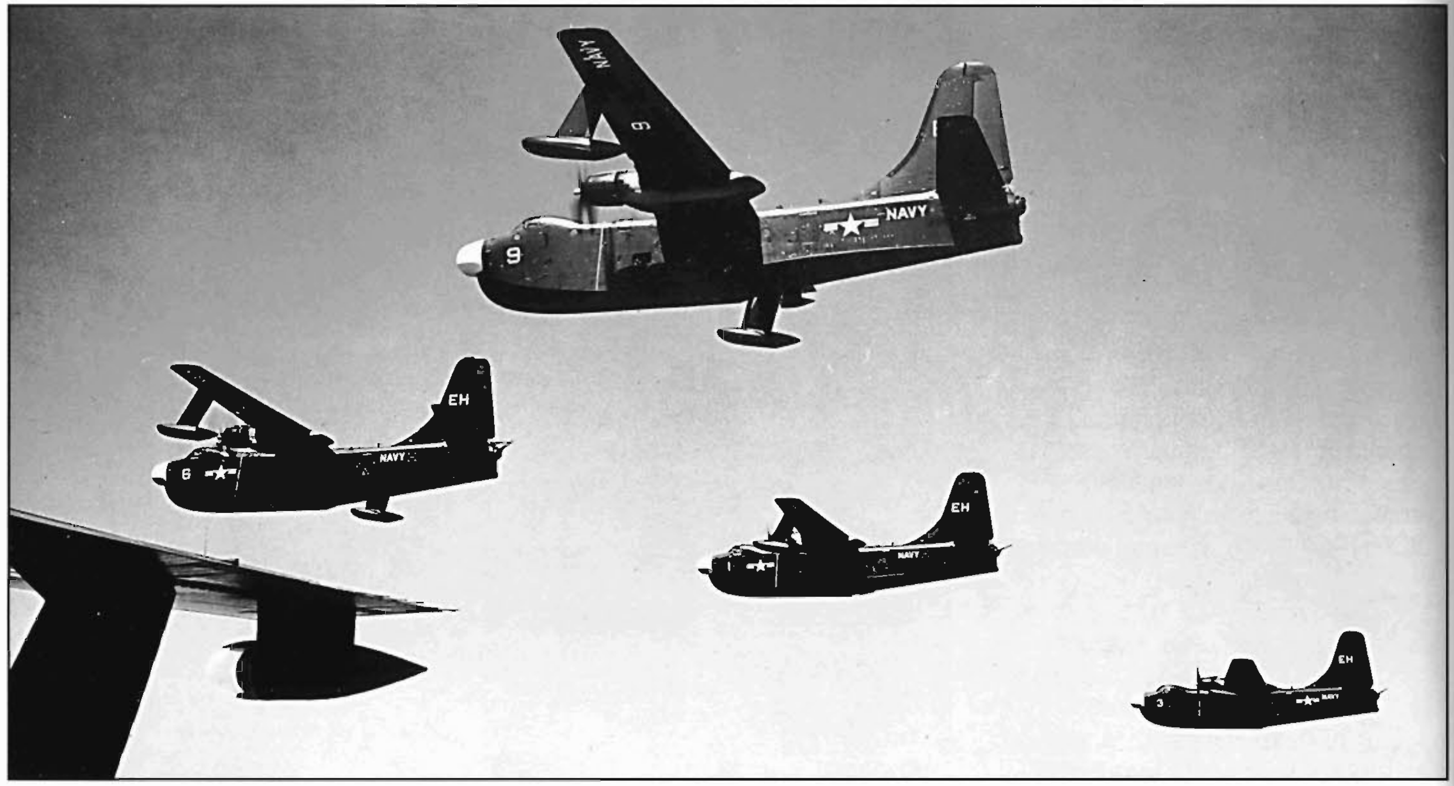


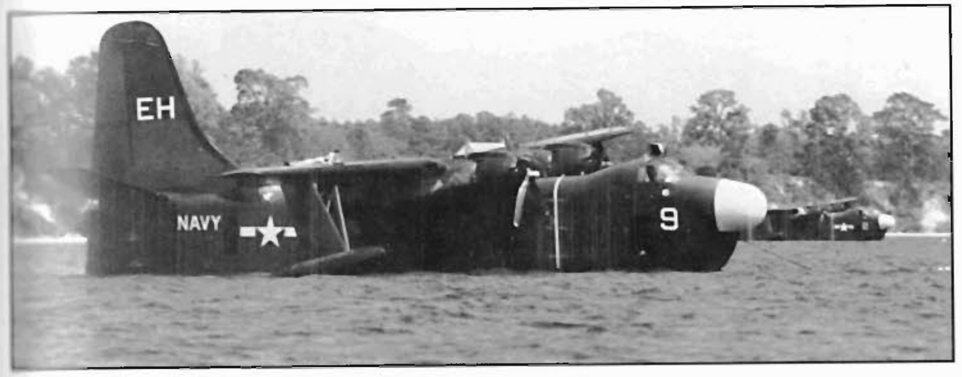
Above, VP-49 P5M-1 at anchor in the early '50s. "EA" tail code would change to "LP" in July 1957. (Jack Roderick) Below, five VP-56 P5M-1s in flight, "EH" tail code would change to "LN" in July. (USN)





Above and below, VP-56 P5M-1s over the Norfolk area with BuNo 130273 EH/9 in the foreground. (USN) At right, VP-49 Crew Three poses in front of P5M-1 BuNo 127706 which was operated from Bermuda during the filming of *Look to the Sea* in 1955. (USN)





Above, VP-56 P5M-1 moored on the Rappahannock River in Virginia while operating with the USS Currituck (AV-7) on 30 August 1955. (National Archives) Below, VP-56 P5M-2 taxis while operating with the Currituck on 30 August 1955. (National Archives) Bottom, VP-45 P5M-1 BuNo 135456 with original "EE" tail code over Coco Solo, Canal Zone, during early 1955.(USN)

planes alongside while at anchor, or through a "refueling buoy" when underway and even when submerged. *Guavina* carried out aircraft refueling exercises off the East Coast of the United States for most of 1956, and made a two-month deployment to the Mediterranean working with *Currituck* in supporting VP-56.

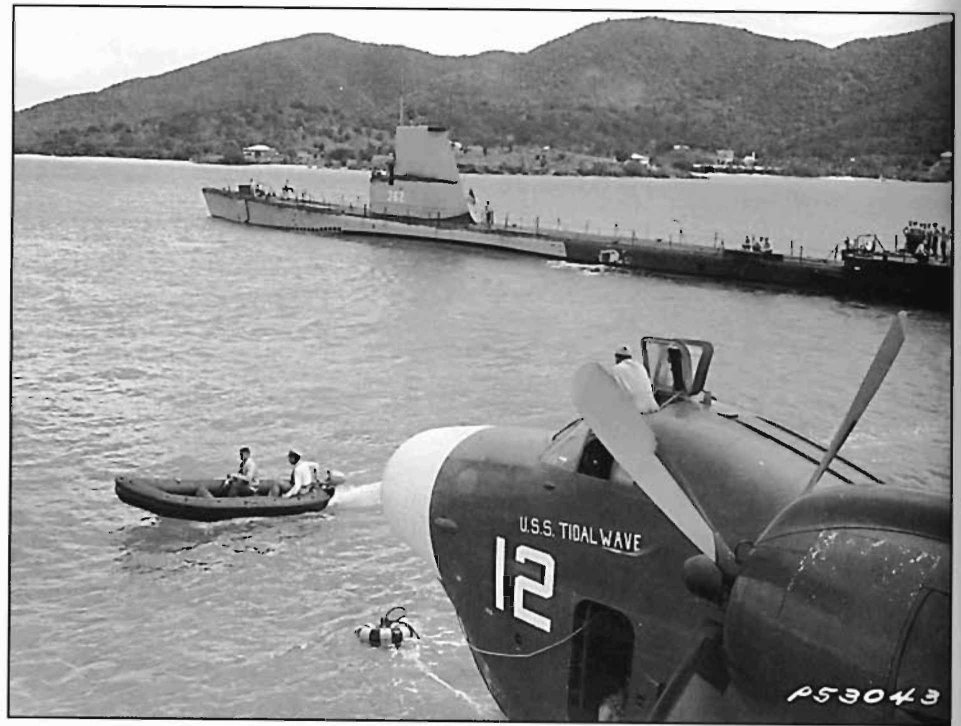
Currituck made another European cruise between 22 August and 13 December 1956, this time to support Marlins of VP-56 operating with the 6th Fleet in the Mediterranean. The Marlins had flown to Europe via Argentia to Pembroke Dock, Wales, where they were met by *Currituck*. *Currituck* sailed from Wales bound for Taranto, Italy, but was diverted to perform the recovery of a disabled Marlin at Marignane (near Marseilles), France. Because of *Currituck's* unscheduled diversion to Marseilles, the Marlins were initially tended in Taranto by the Advanced Base Ship *Alameda County* (AVB-1). *Alameda County* was a converted Landing Ship Tank (LST-32) and with about 200 aircrew on board, accommodations were Spartan. *Currituck* was a welcome sight to the aircrews when she finally arrived at Taranto. *Currituck* also established seadromes at Pollensa Bay, Majorca, and Augusta Bay, Sicily.

For one phase of the Mediterranean operations, the full squadron of twelve VP-56 aircraft was supported by *Guavina* at Souda Bay, Crete, and a section of three aircraft visited Athens, Greece. In another phase, two aircraft were directed, without explanation, to land at a geographic point, "Station Alfa" in the middle of the Mediterranean Sea. Shortly after the Marlins landed, *Guavina* surfaced nearby and performed a token fueling. This operation was a graphic demonstration of a planned operational technique for the future P6M SeaMaster.

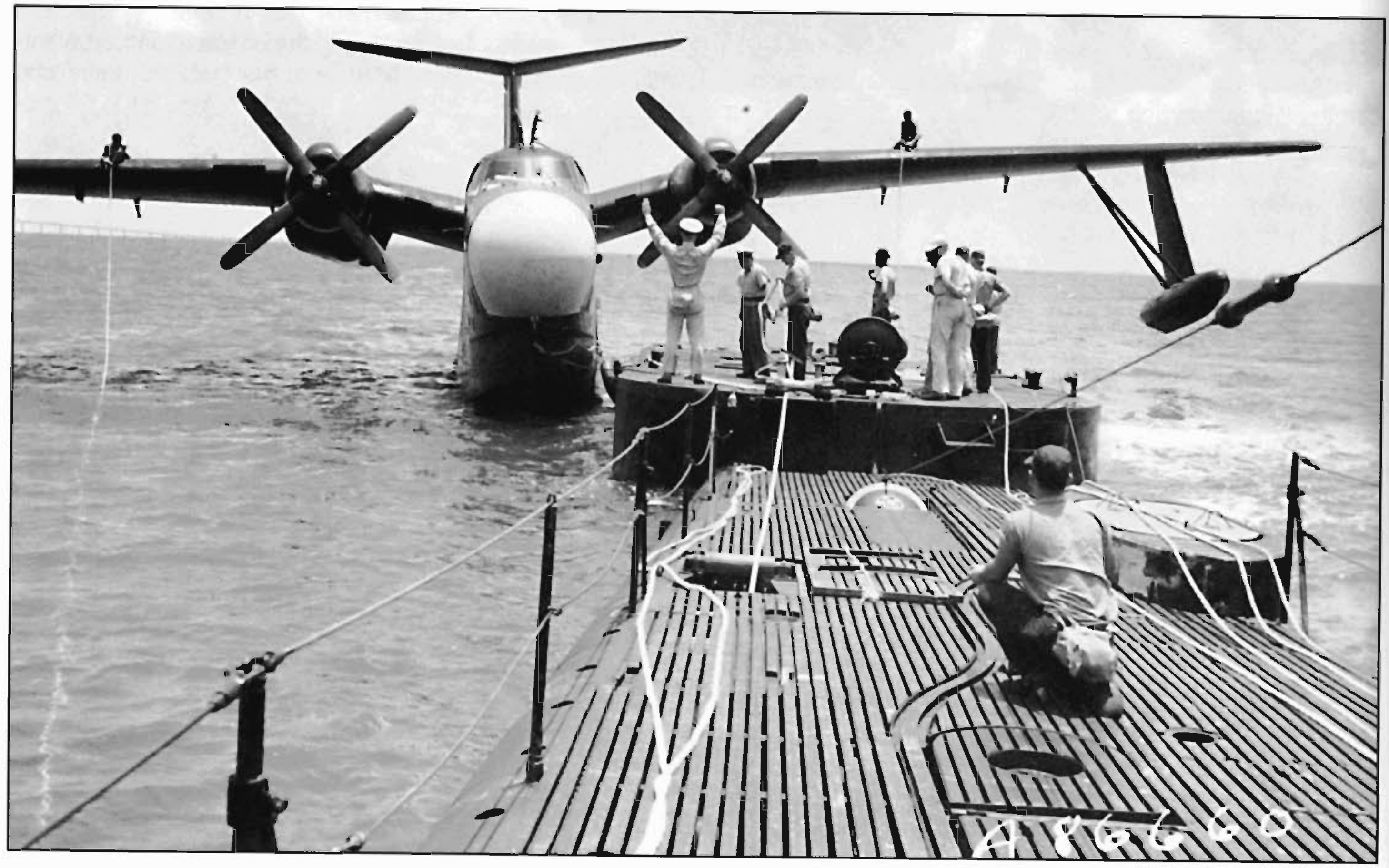
During the cruise, *Currituck* hoisted Marlins to her deck 32 times and supplied them with over 340,000 gallons of aviation fuel. The Marlins flew some 1,350 hours while operating in the Mediterranean. Up to this point, the Marlin European deployment appeared to be a complete success.

However, the route selected by Commander Fleet Air Wings Atlantic (COMFAIRWINGSLANT) in Norfolk for the return of the VP-56 Marlins to the United States was to be by four sections of three aircraft going from Gibraltar to Horta Bay at Faial Island in the Azores (where they would be serviced by *Currituck*), from the Azores to Bermuda and from Bermuda to Norfolk. Although Horta had been a flying boat stop on the trans-Atlantic route since the days of the NC-4, it was a far from ideal seaplane operating area. Although there was a sheltered mooring area, the actual seaplane take-off and landing area was outside the breakwater in

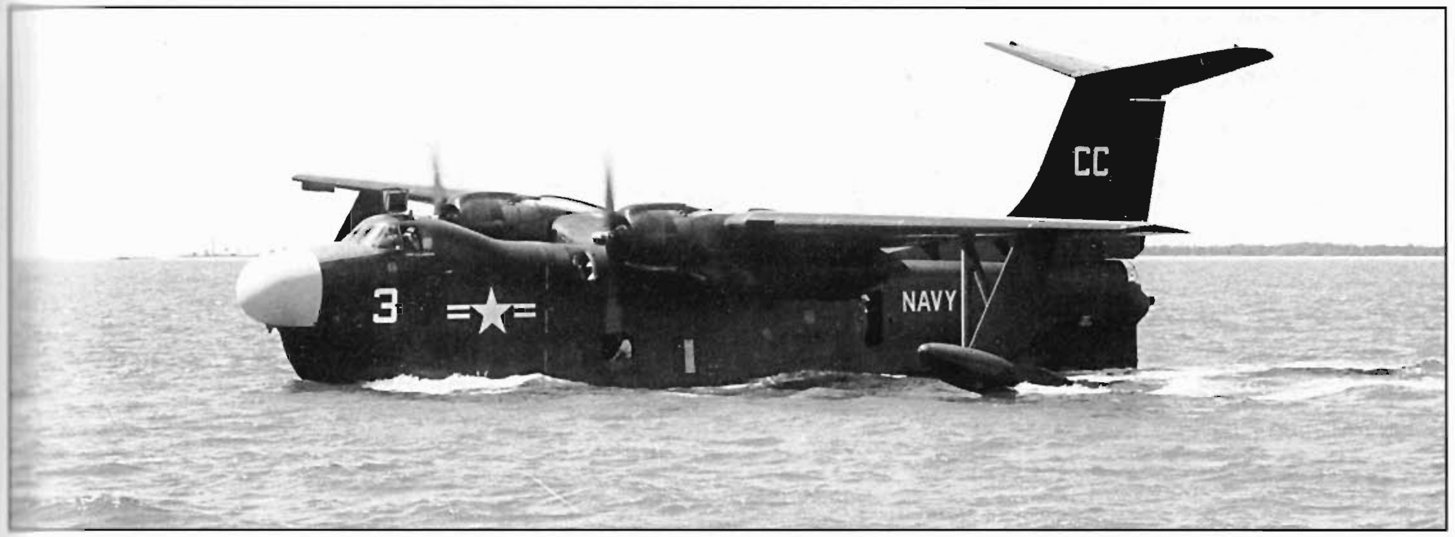
the open sea. The seaplane area was plagued by a perennial Atlantic swell and by shifting winds caused by flow around Mt. Pico, and was considered particularly dangerous in the winter. Furthermore, because of the distance from Horta to Bermuda, the Marlins would be required to take-off from the Azores with a full load of fuel in an overload gross weight condition. After a careful examination of the situation, the commanding officer of VP-56, CDR Donald G. Miller, sent a message to the Wing recommending that the route be changed to the old "Southern Flying Boat Route": Gibraltar to Dakar; crossing the South Atlantic from Dakar to Natal, Brazil; north from Natal to Belem, Brazil; then from Belem to Trinidad.



Above, VP-56 Marlin with USS Tidal Wave painted above the forward hatch during test operations with submarine seaplane tender USS Guavina in 1956. (USN) Below, VP-56 P5M-2 coming alongside the afterdeck of Guavina for refueling in 1956. (USN)



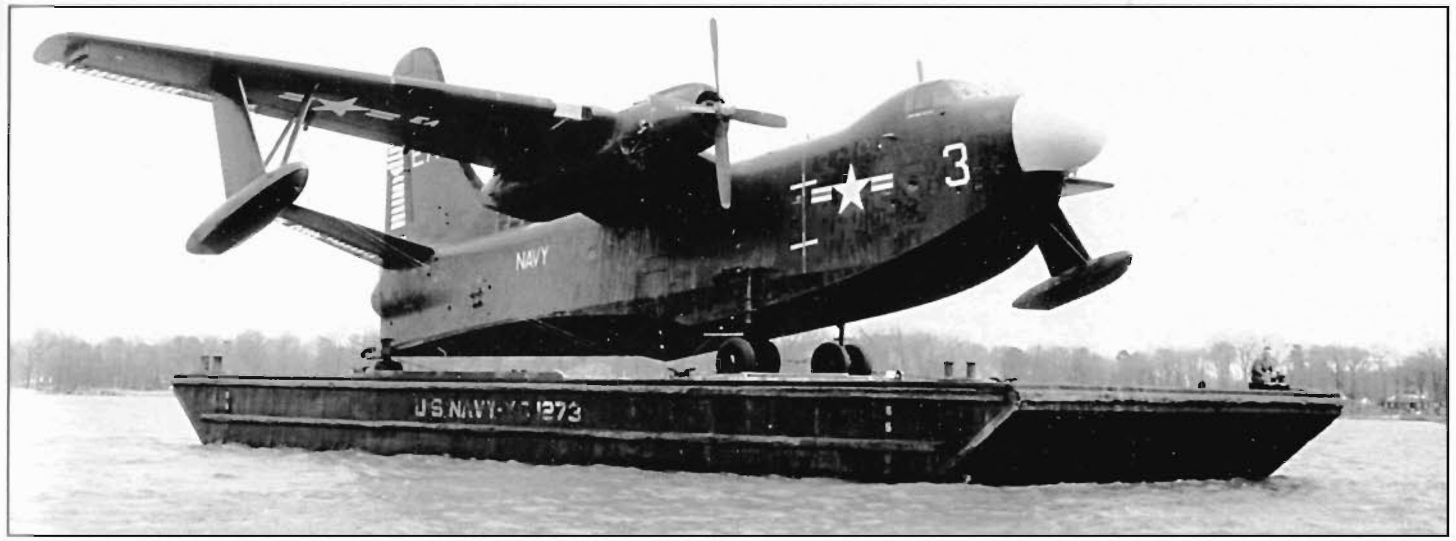
The Wing did not approve CDR Miller's recommendation. In an attempt to shorten the time at Horta and to beat the worsening winter conditions, the Wing recruited three volunteer relief crews from VP-44 at Norfolk and sent them to *Currituck.* The idea was that these crews would relieve the crews of the first three aircraft arriving from Gibraltar and take-off for Bermuda as quickly as the planes could be serviced. Then the crews of the first three would take the aircraft of the second three and so on. Presumably the crews of the last VP-56 section to arrive at Horta would ride *Currituck* back to Norfolk.



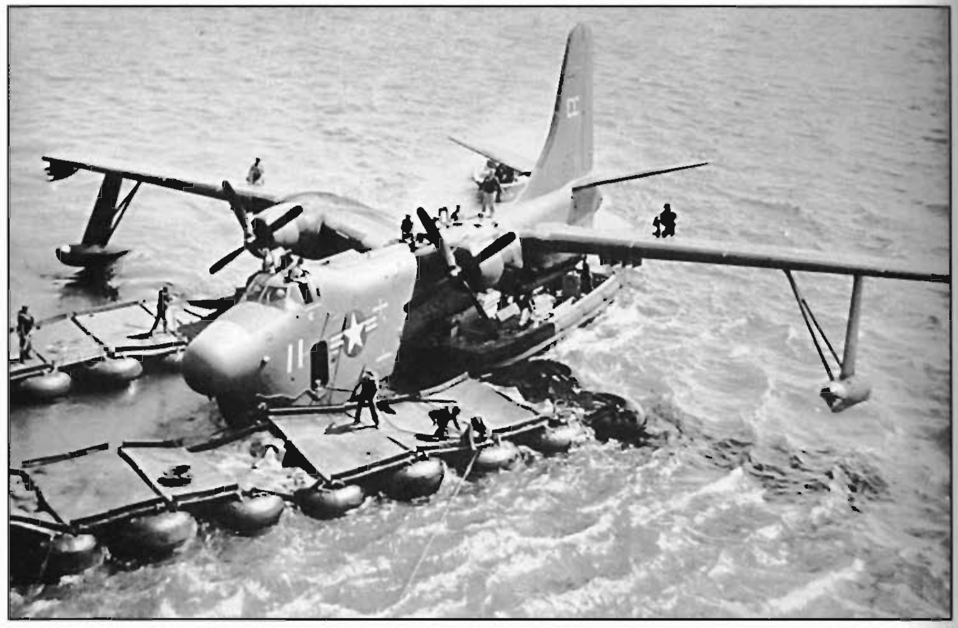
Above, VP-44 P5M-2 taxis at NAS Key West, FL, on 9 May 1956. (Martin) Below, VP-49 P5M-1 (EA tail code) being barged to a repair facility. Note the fabric is missing from the control surfaces. (USN)

The first VP-56 Marlin arrived at *Currituck* from Gibraltar on 11 November 1956 at about 1130 am local time. BuNo 135518, which had been flown in by LT Donald J. Childers, was turned over to the VP-44 relief crew with LT Donald E. Brunner as Patrol Plane Commander (PPC). LT Brunner was a very qualified pilot, with over 5000 hours in seaplanes. Coincidentally, in 1950 LT Brunner had been one of the author's instructors in the PBM Mariner at Advanced Training Unit 10 (ATU-10) in Corpus Christi.

BuNo 135518 was fueled and serviced and by 2 pm LT Brunner cast-off from the mooring buoy. Because of the fuel required for the flight to Bermuda, the aircraft was loaded to approximately 80,000 pounds, about 2,000 pounds over Martin's recommended smooth water take-off weight. Brunner maneuvered on the water for some time while determining the most favorable take-off direction and he made three high speed taxi runs on a heading he had selected for his take-off. This heading was parallel to the primary swell and quartering the secondary swell. At 2:40 pm LT Brunner began his take-off run. The wind at this time should have given him a 9 knot headwind, but unbeknownst to him, after the take-off began, the wind shifted dramatically and in actuality he had an 8 knot tailwind. A number of porpoises were observed during the early part of the take-off, but these seemed to smooth out after all four Jet Assisted Take-Off (JATO) bottles were fired. After the JATO was expended, the aircraft began to bounce out of the water. Each bounce became higher until the aircraft left the water in a nose-high attitude and fell back into the water at a high rate of descent. Upon impact the aircraft broke up and caught fire. Four crewmen were lost. The Accident Investigation Board blamed the accident: "as a result of an attempted take-off of a heavily loaded aircraft in a seadrome having a confused swell system with a down-wind component of 8 knots" and "The immediate cause was contacting a secondary cross swell at a point where the aircraft was near flying speed under conditions which made a



At right and below, VP-44 P5M-1 entering rubber dock while operating with the USS Ashland on 10 April 1957. (National Archives)



successful abortion improbable."

No further take-offs were attempted that day. The next day, three more aircraft arrived at Horta. Seadrome conditions for heavily loaded take-offs did not improve as the remaining six aircraft arrived from Gibraltar. With eleven aircraft now at Horta, CDR Miller sent another message to the Wing again recommending rerouting the squadron via the Southern Route. This approach would permit the aircraft to take-off from Horta lightly loaded for the relatively short trip back to Gibraltar. CDR Miller's recommendation was ignored.

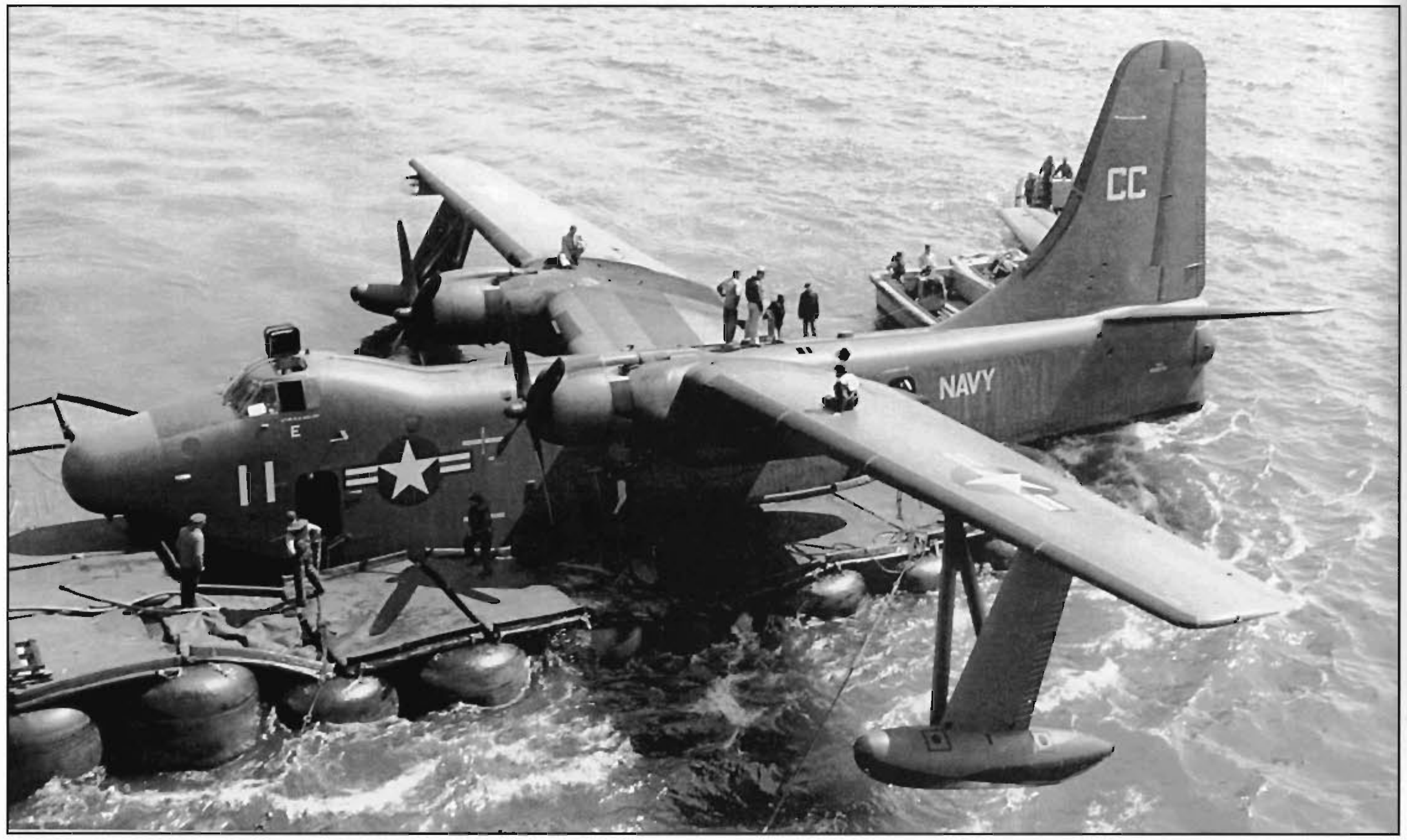
For the next two weeks, the Marlin pilots lightened their aircraft as much as possible and awaited more favorable open-ocean take-off conditions. They observed conditions were best around dawn and eventually all made a successful first light take-off for Bermuda. While successful, the take-offs have been described as "hairy" and dangerous. Each was perilously close to disaster; a sputtering engine would have dropped the aircraft into the ocean.

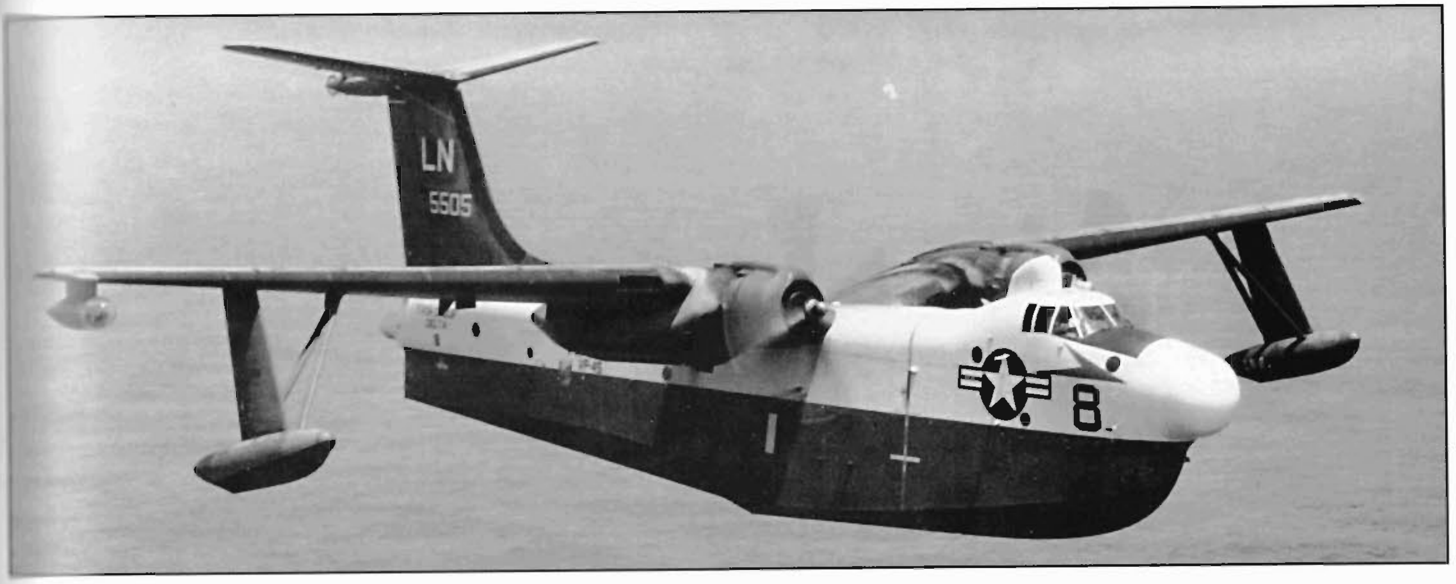
Thanks to the intransigence of the Wing, the successes of the VP-56 Mediterranean cruise were forgotten and the cruise became known in the seaplane community as the "Azores Fiasco". There were no further Marlin deployments to Europe.

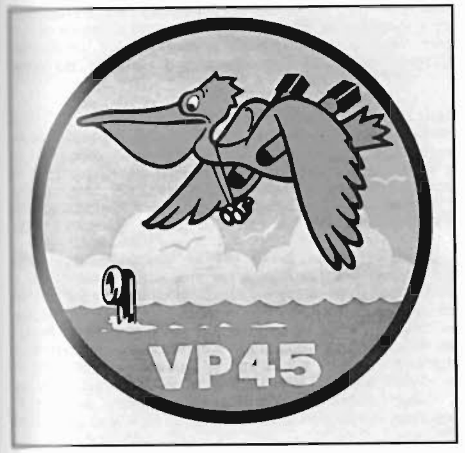
During 1956, VP-49 participated in the NATO exercises "Hourglass", "New Broom" and "Hunter-Killer". On 9 November 1956, a VP-49 aircraft was lost during a patrol launched as part of the United States world-wide strategic response to the Anglo-French Suez invasion. The cause of the accident was unknown. The entire crew of ten was lost.

VP-45 again deployed to Corpus Christi from the Canal Zone for "Operation NARMID 56", and in September the squadron's homeport was moved from the Canal Zone to Bermuda.

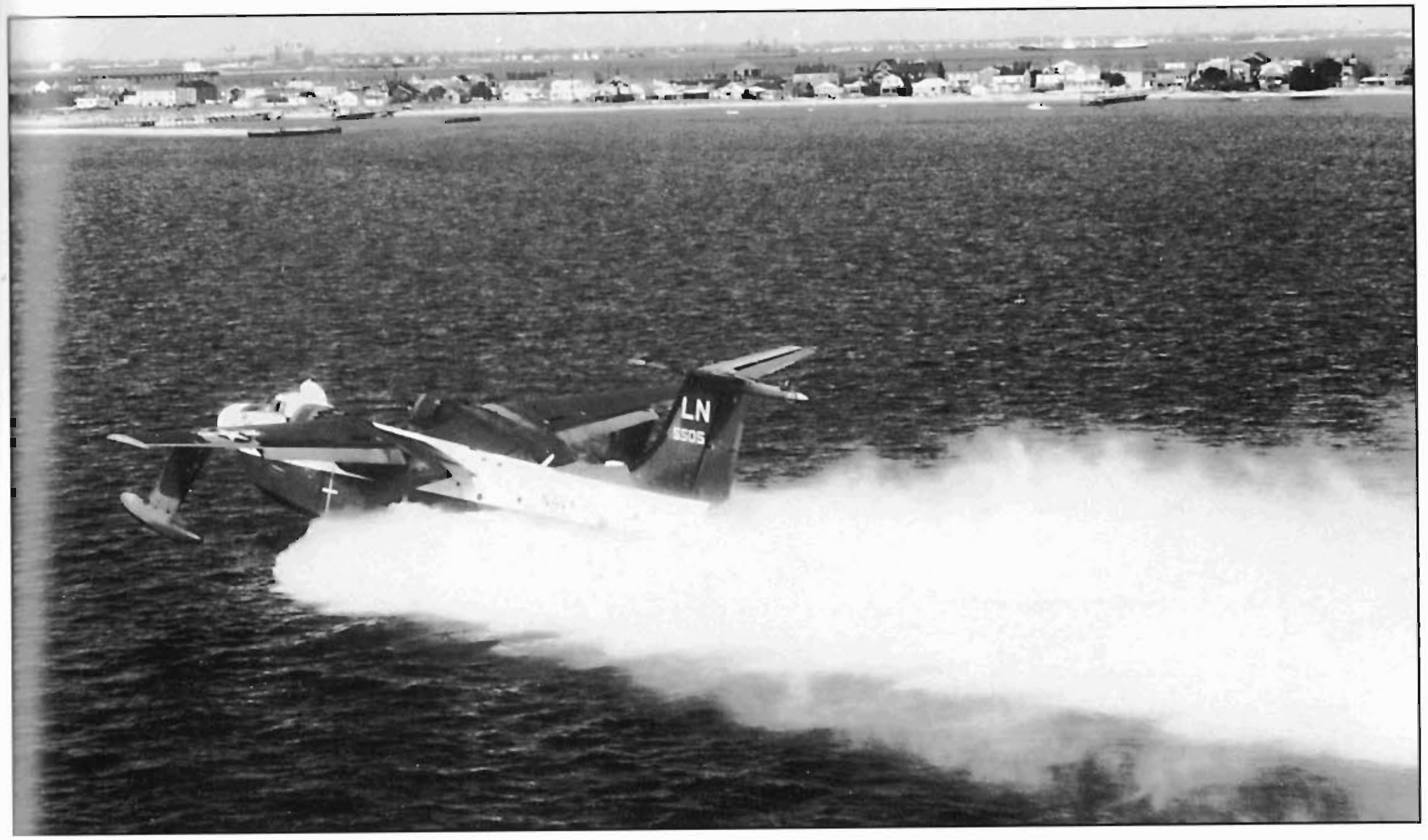
On 1 November 1956, the landing ship dock U.S.S. *Ashland* (LSD-1) was transferred to the control of Commander, Naval Air Forces, Atlantic, for SeaMaster basing exper-







Above, VP-45 SP-5B BuNo 135505 in flight while assigned to Task Group Delta on 18 May 1962. (USN) Below, VP-45 SP-5B BuNo 135505 on take-off on 14 November 1962. (USN) The squadron transitioned to the P-3A Orion starting in September 1963.



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iments using Marlins as test vehicles.

1957: On February 18, 1957, with only minor ship's modifications, *Ashland* experimented with seaplane recovery and launching techniques in the upper Chesapeake Bay with P5M-2s of VP-56. *Ashland* then entered the shipyard for configuration improvements which were completed by July and the ship deployed to the Caribbean for Exercise "Caribops 1957" in August and September. During this exercise, *Ashland* established seadromes in San Juan, Fajardo, Ponce and Jobos Bay, Puerto Rico, as well as at Charlotte Amalie in the Virgin Islands to service four P5Ms of VP-49 deployed from Bermuda and two of VP-44's deployed from Norfolk. Routine rearming and refueling of the aircraft was by boats from *Ashland.* During Caribops 1957, the P5Ms engaged in ASW, rocket firing and mining exercises and in refueling exercises with *Guavina.* At least three different P5Ms were tender-docked (tendocked) on *Ashland* for repair work during 18 separate evolutions. Although *Ashland's* performance as a seaplane tender was completely satisfactory, because of slippage in the SeaMaster program *Ashland* was decommissioned on 14 September 1957 and placed in the Atlantic Reserve Fleet.

In March 1957, VP-45 and VP-49, from their Bermuda base, flew anti-intruder patrols to cover the meeting of President Eisenhower and British Prime Minister MacMillian on the island.

The large seaplane tender, *Albemarle,* was recommissioned at Philadelphia on 21 October 1957 after receiving special modifications to support the Martin P6M SeaMaster jet flying boat. After a Caribbean shakedown cruise the ship proceeded to San Juan and Trinidad, carrying out tending operations with all four Atlantic squadrons of Marlins and participating in "Springboard" exercises in 1958.

During 1957, VP-56 began operations designed to demonstrate the mobility of the flying boat with a minimum of support. VP-56 put three planes on buoys in Willoughby Bay in Norfolk for three weeks with no shore support and no buoy watch, using a predetermined stock of spares. Pneumatic floating docks were used for hull inspection and servicing. Full operational availability was maintained.

1958: In January 1958, VP-56 took a two plane section to NAS Argentia to protest the winter restrictions on seaplane operations. Each plane had an inflatable Marine Assault Boat with a 10HP outboard for access to the beach. The aircraft refueled at Argentia, Stevensville and Halifax from fuel trucks on the pier. Two more mobility exercises were approved: a three plane section to Argentia, Iceland and Bodo, Norway, on to Rota, Spain, and the Azores and one for additional operations with the *Guavina.* These operations were canceled when corrosion was discovered in Marlin flap hinges that imposed a restriction on the use of full flaps.

The *Currituck* entered the Philadelphia Naval Shipyard in January 1958 for a complete overhaul and modernization, leaving *Albemarle* as the sole Atlantic seaplane tender. During 1958, *Guavina* continued to work with Marlins along the East Coast. The author recalls refueling his VX-1 Marlin from *Guavina* at Fort Jefferson in the Dry Tortugas in the summer of 1958 *Albemarle* visited Bermuda in November and worked tender exercises with VP-49.

1959: Although *Guavina* had demonstrated refueling seaplanes from submarines was practical and efficient, with the demise of the SeaMaster program *Guavina* was put into reserve on January 4, 1959. On 27 January 1959 VP-56 suffered the loss of a P5M-2 when the starboard Constant Speed Drive (CSD) on BuNo 135529 caught fire. The aircraft crashed during an instrument approach to its fogged-in base and four crewmen were lost. In July 1959, *Albemarle* and *Alameda County* supported VP-56 for an exercise at Halifax, Nova Scotia, and VP-45 again deployed to Corpus Christi for Exercise NARMID 59.

1960: In 1960 *Albemarle* tended Marlins during the annual Caribbean "Springboard" exercises and performed escort duty for a distressed VP-44 Marlin which was taxiing from Grand Turk Island to Guantanamo

NO SANCTUARY IN THE DEEP
PATROL SQUADRON 49

Above, VP-49 P5M-2 BuNo 135527 with lightning bolt on tail in December 1960. (USN) Below, VP-49 ramp with SP-5Bs BuNo 135542 and 135488 in July 1963. (Jack Moore via NMNA)

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VP-49

Below, two VP-49 Marlins, BuNos 135542 and 141258 in flight over their home base Bermuda on 15 February 1962. (USN)

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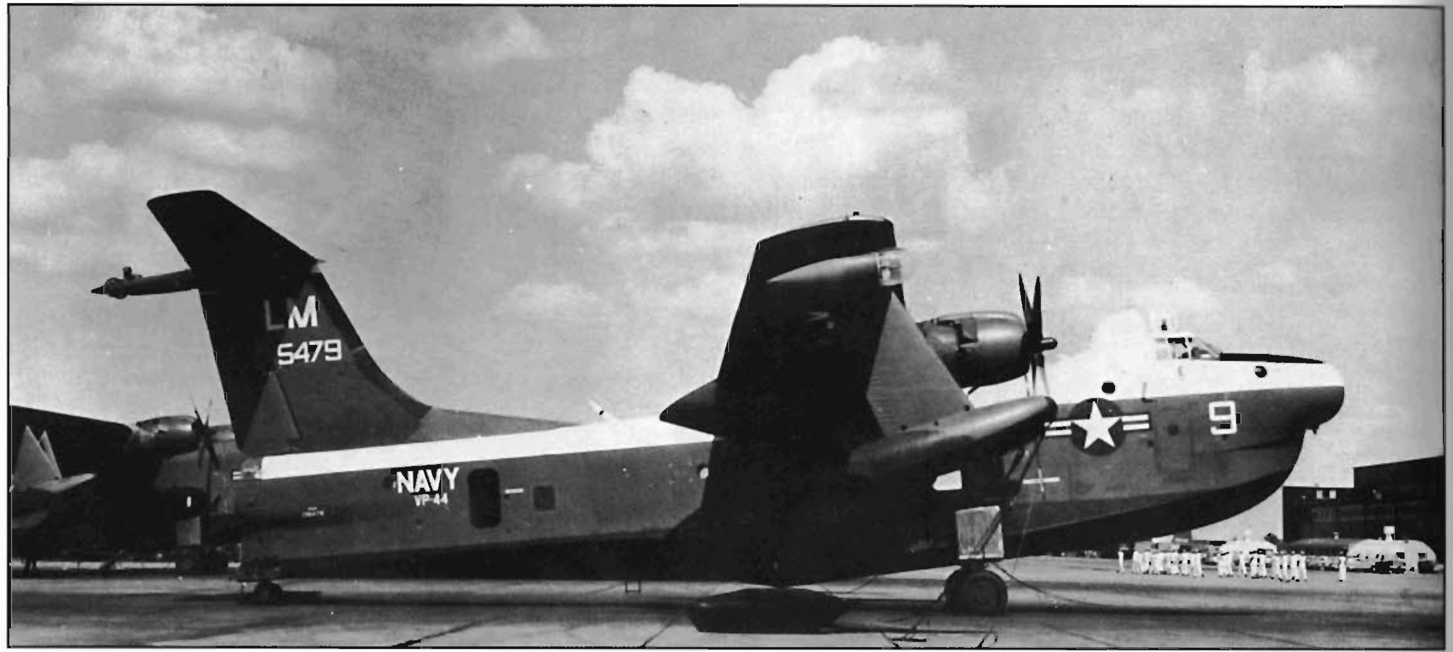


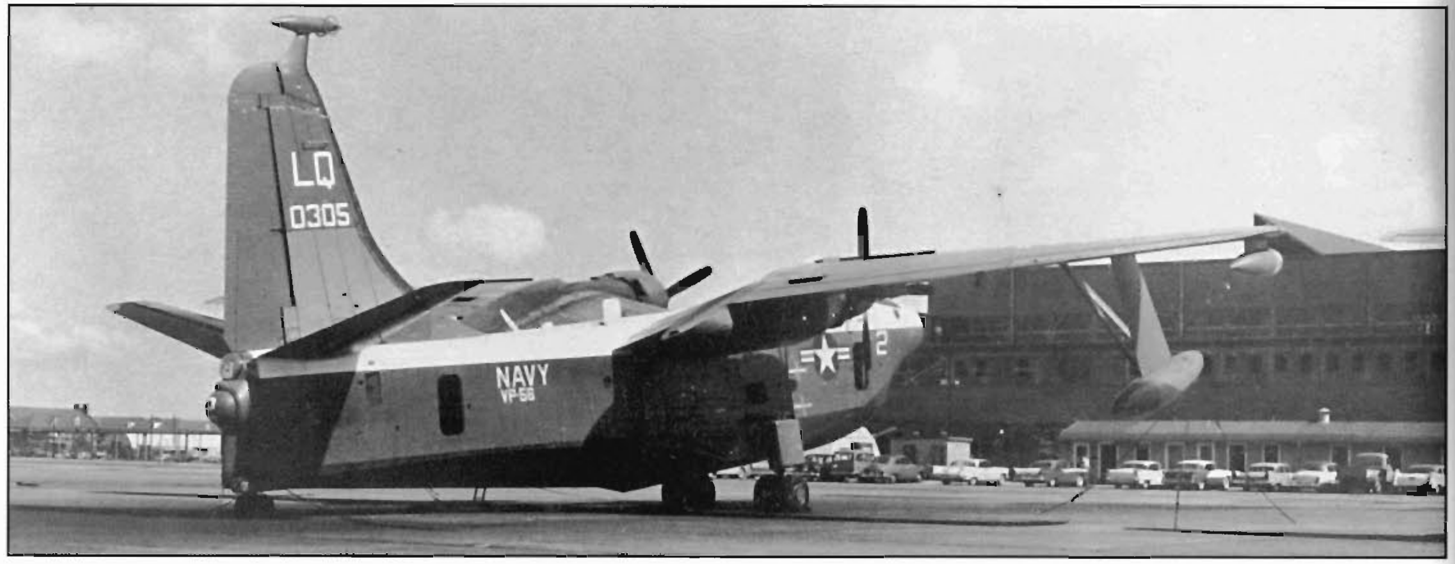
Bay, Cuba. On May 17th, LTJG Don Florko of VP-45 took off from Bermuda in P5M-1 BuNo 135465 for a logistic flight to Norfolk. Shortly after take-off, problems occurred in one of the engine-driven generators and LTJG Florko returned to Bermuda. As the aircraft touched down the engine caught fire and the aircraft was abandoned. All 17 crewmen and passengers were rescued.

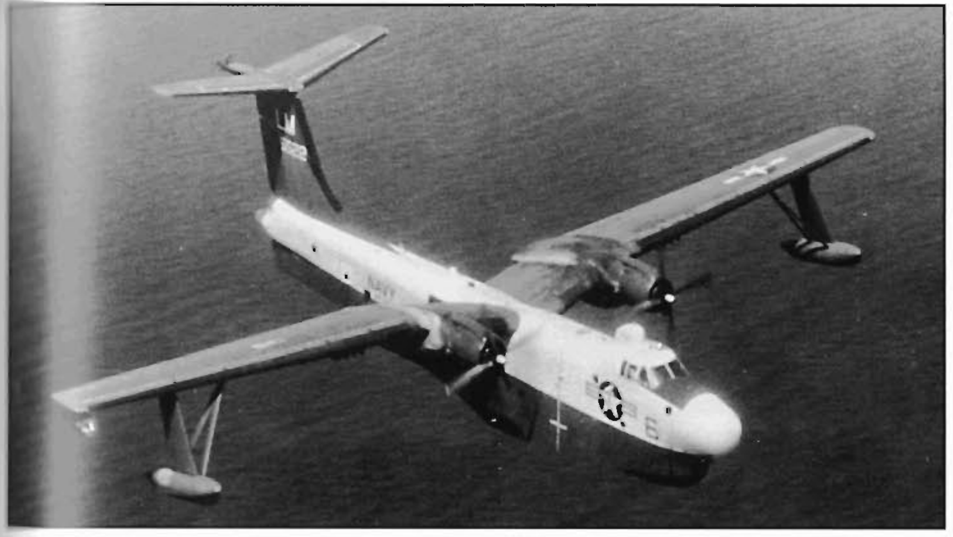
Albemarle, which had never tendered the P6M SeaMaster for which it was outfitted, was placed out of commission, in reserve, on 21 October 1960. Upon completion of its shipyard overhaul in late 1960, *Currituck* was transferred to the Pacific Fleet. With the decommissioning of *Albemarle* and the transfer of *Currituck* to the Pacific, there was no further seaplane tender support for Atlantic Fleet Marlins.

With no seaplane tenders, there was little justification to maintain flying boats in the Atlantic Fleet, except for a unique situation in Bermuda. Bermuda was an essential base for Cold War ASW flights, but the Naval Station Bermuda was a seaplane-only facility. The Bermuda landplane field, Kindley Air Force Base, was under the jurisdiction of the U.S. Air Force and was not immediately available for Navy use. Because of this, seaplane squadrons VP-45 and VP-49 were retained in an active status in Bermuda, but Norfolk-based VP-44 and VP-56 were redesignated as landplane squadrons. VP-44 began to transition to the Lockheed P2V Neptune in December 1960.

Above, VP-44 P5M-2 BuNo 135479 shares the ramp with a PBM Mariner. (USN) Below, VP-56 P5M-1 BuNo 130305 with squadron's second tail code "LQ". Area below BuNo was da-glo red. (USN)

1961: VP-44 became fully landplane operational in April 1961 and VP-56 received its first Lockheed P2V-7 Neptune in January, completing its transition to the Neptune in June. In September 1961, VP-45 became a part of Task Group Delta, a fleet unit dedicated to develop improved ASW tactics and procedures. On 22 September VP-45 Marlin BuNo 140144 suffered an engine failure and crashed north of Bermuda with the loss of seven crewmen. Three men were rescued, in a large measure due to the efforts of a former Marlin crew from VP-56. As Captain Ralph A. Mason remembers: "I was flying P2V-7 side number LQ-12 on a night ASW flight when we received the radio report of a downed plane. We were just a short distance away and went to their last known position. After an hour of searching, one of my crew spotted a light on the water. We flew over to the light and radioed for ships to proceed to our position. We circled the people in the water until first light, dropping flares hoping to attract some ships to help. As the sun was coming up we dropped a couple of sonobuoys near the survivors and found the merchant ship S.S. *African Pilot* on the radar and flew to him and got him to head for the survivors. We dropped smoke lights ahead of the ship to lead him to the crew. As soon as the ship had the crew in sight we headed for BDA (Bermuda) and landed on fumes—getting 13 hours out of the P2V-7, We leaned the engines until we had 100 rpm drop and did a little praying and a lot of sweating before we hit the runway at Bermuda. I received a letter from one of the enlisted men a month later thanking our crew for saving his life." Three crewmen were rescued by the *African Pilot.*



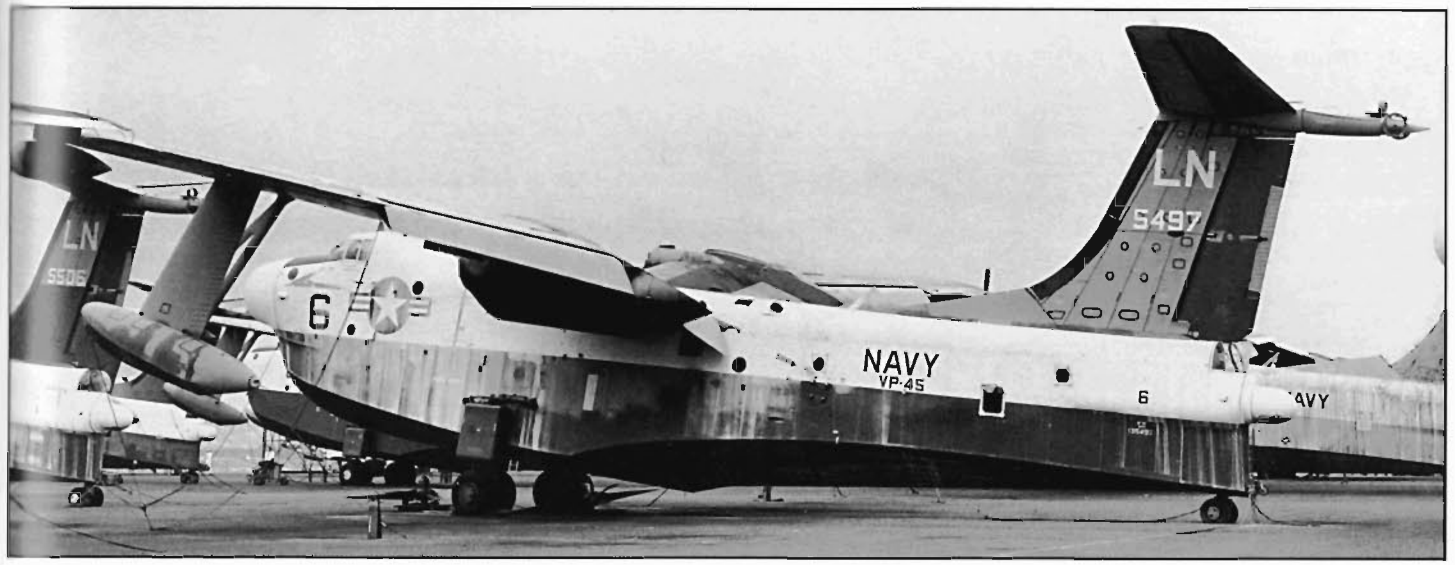


1962: On 29 October 1962, President John F. Kennedy signed into effect a quarantine on all shipping in and out of Cuba. Although the Bermuda-based Marlin squadrons VP-45 and VP-49 were heavily involved in shipping surveillance flights throughout the quarantine, the Missile Crisis expedited the use of Kindley AFB by the Navy's new Orions and signaled the end of Marlin Atlantic Fleet operations.

1963: From January through August, VP-45 maintained a detachment of Marlins at Guantanamo Bay, assisting in the continuing surveillance of Cuba. These were relieved during June by Marlins from VP-49. On 1 September VP-49's homeport was transferred to Patuxent River and a detachment was established there for P-3 Orion transition, although the main body of the squadron remained at Bermuda. In September 1963, VP-45 established detachments at NAS Patuxent River, Maryland and NAS Jacksonville, Florida to commence its transition to the Orion. VP-45 flew the last operational Marlin sortie on 24 December 1963.

1964: On 1 January 1964, VP-45's homeport was changed to NAS Jacksonville, officially ending Atlantic Fleet seaplane operations.

Above left, VP-44 P5M-2 BuNo 135522 on 17 March 1961. (USN) Below, VP-45 SP-5B BuNo 135497 in storage awaiting its fate with the scrapper's torch. (USN)

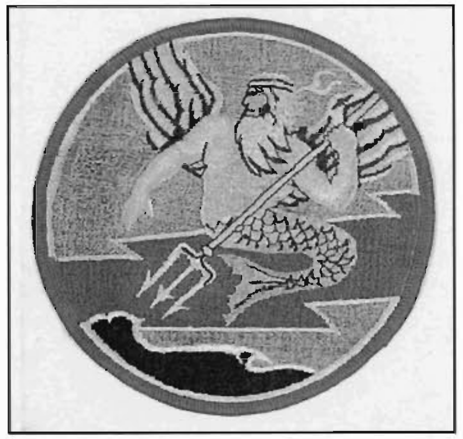


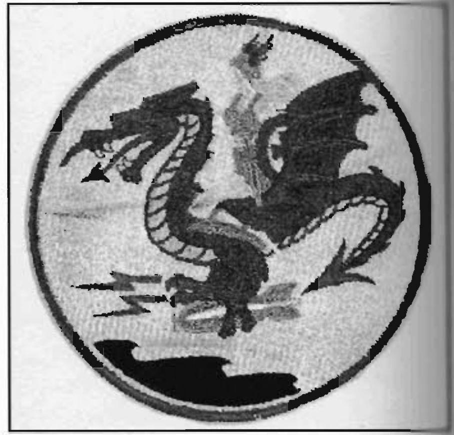
Pacific Fleet, 1953-1967

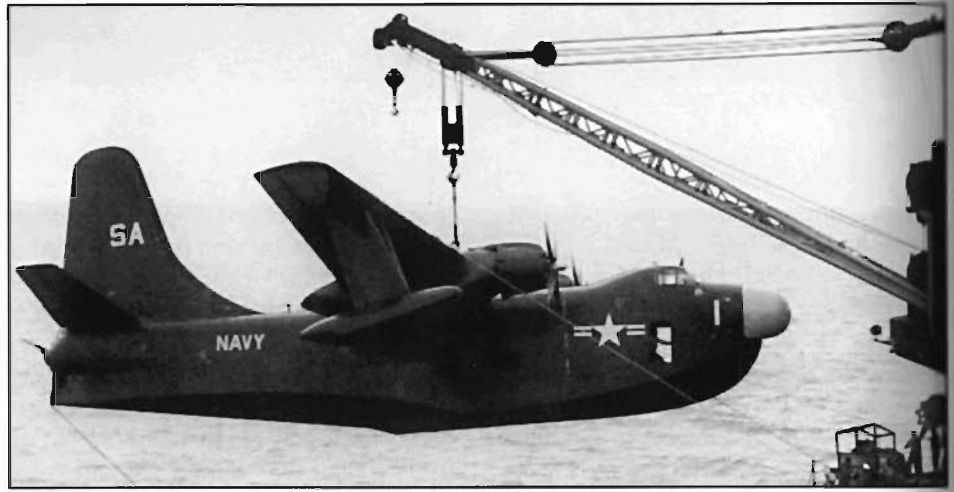
At the beginning of the Marlin era, there were six Pacific Fleet seaplane squadrons: VP-40, VP-42, VP-46, VP-47, VP-48 and VP-50. All were equipped with the PBM-5S2 Mariner. These six squadrons maintained two squadrons in a deployed status to the Far East: one squadron based at the Naval Station Sangley Point in the Philippines, the other at Iwakuni, Japan. From 1954 to 1959 a rotation was in place where VP-40, VP-42 and VP-46 in that order rotated through the Philippines and VP-48, VP-47 and VP-50 in that order rotated through Iwakuni. The deployed squadrons also operated from seaplane tenders at Okinawa and in the Pescadores and from other sites when directed. They spent six months "on station" at their deployment sites. The usual itinerary for the squadrons from the United States to the Far East was from the West Coast to NAS Ford Island, Hawaii, where 3 to 4 weeks was spent in ASW training and an Operational Readiness Inspection (ORI); then on to Johnston Island; to Kwajalein Atoll; to Apra Harbor, Guam, and then on to the Philippines or Japan.

1953: Deliveries of the new Marlins to the Pacific Fleet operational seaplane squadrons began in April 1953. VP-40 was the first squadron to receive the Marlin, followed by VP-46 in September 1953 and VP-42 in November. All three were based at NAS San Diego (redesignated NAS North Island in 1955).

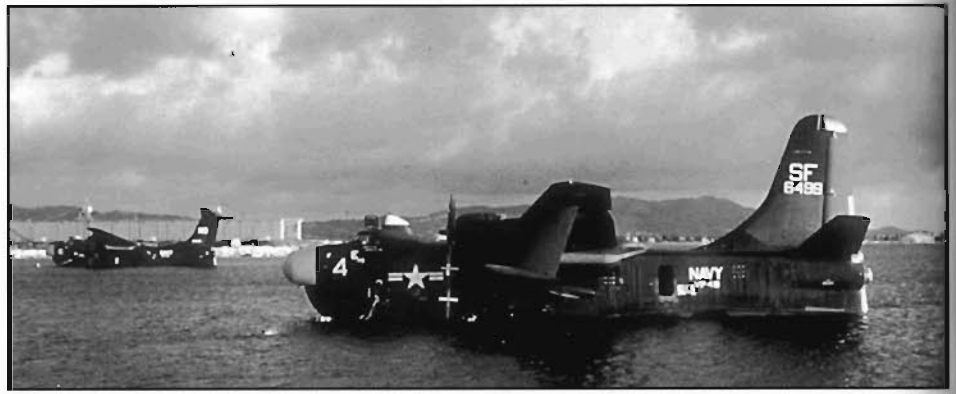
1954: VP-40 made the first Far East P5M-1 deployment to Sangley Point, operating there between January and July. The first Pacific Marlin casualty occurred on 21 May 1954 when a VP-46 aircraft experienced engine problems while enroute from San Diego to Hawaii. After the failure of both engines, the aircraft made a hard power-off open sea landing, broke up and sank. Four crewmen were lost. In June, VP-48, also based in San Diego, received its new Marlins and VP-47, based at NAS Alameda in San Francisco Bay, transitioned to the Marlin in October. In October, VP-40 was followed at Sangley Point by VP-42.

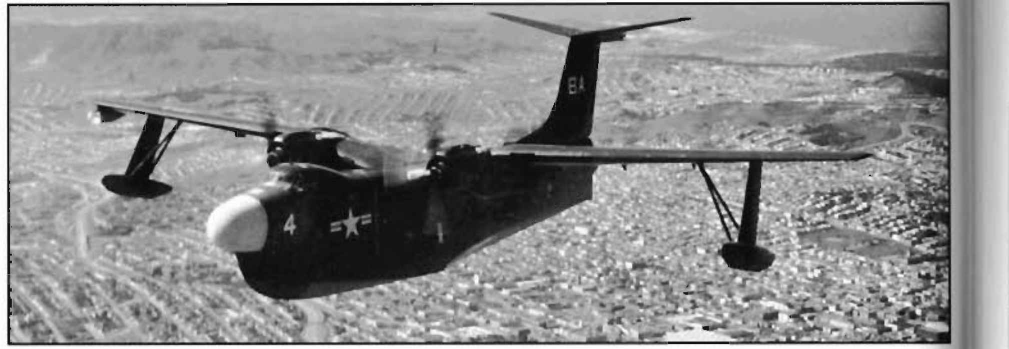






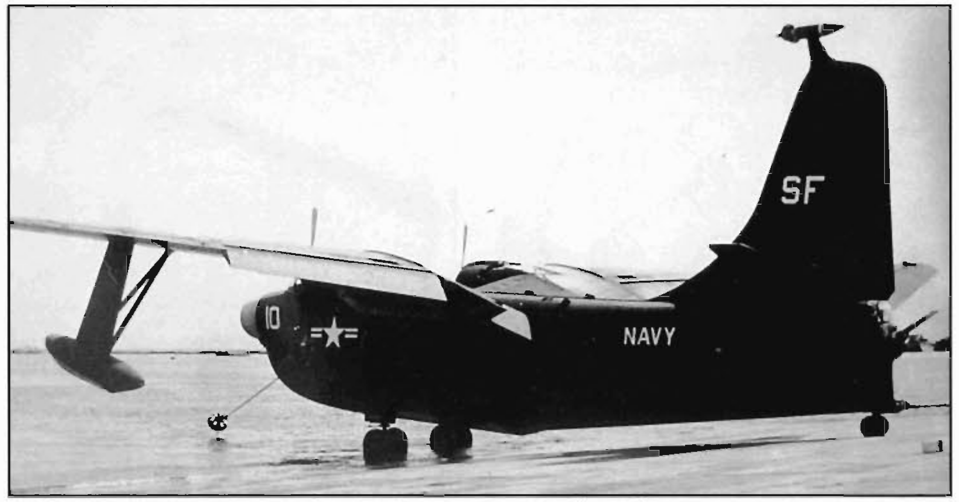
At top left, early VP-42 Marlin insignia. (via Doug Siegfried) At top right, VP-48 early Marlin insignia. (via Doug Siegfried) Above, VP-42 P5M-1 with early "SA" tail code being lifted aboard a tender in 1954. Note tail guns. (USN) Below, VP-48 P5M-1 BuNo 6499 at anchor with a P5M-2 from VP-47. (via Tailhook Association) Bottom, VP-47 P5M-2 with original "BA" tail code over San Francisco, CA. (USN)



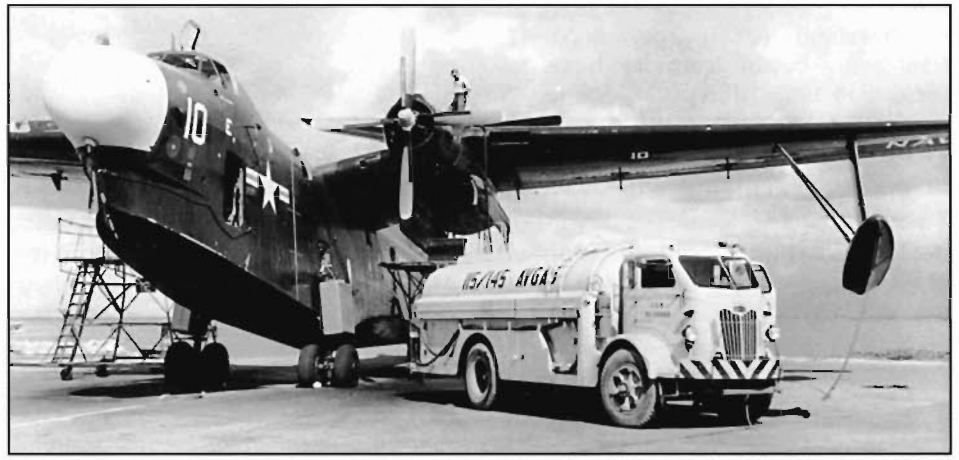


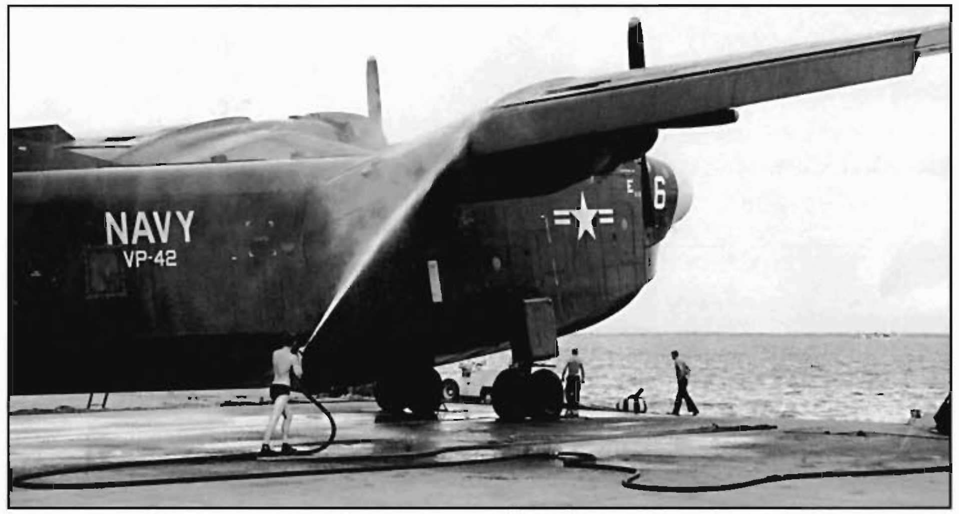
1955: In February 1955 VP-42 was supported by *Salisbury Sound* (which also served as flagship of the Formosa Patrol Force) during the evacuation of the Tachen Islands. VP-42 provided surface surveillance and antisubmarine warfare protection to the evacuation force. The Tachen Islands evacuation was a massive Seventh Fleet operation that moved nearly 30,000 Nationalist Chinese troops and civilians to Formosa. Two dozen U.S. evacuation ships were backed up by no less than five aircraft carriers. The Tachen Islands operation stabilized the strategic situation in the Formosa Straits and reduced a real threat of nuclear war. Back in San Diego, at the request of the University of California, VP-46 investigated a new volcano named "Barcena" which had recently formed off the coast of Lower California. Through the use of antisubmarine listening devices and tape recordings, representatives from the Scripps Institution at La Jolla were able to determine that the volcano was inactive. The squadron also participated in Project Rockoon, an International Geophysical Year research program. The rockoons were atmospheric investigating balloons initially launched by rocket propulsion. The squadron's mission was to patrol the waters southwest of San Diego to warn surface craft that might be in the rockoon fall-out area. VP-48 became the first Marlin squadron to deploy to Japan, serving at Iwakuni from January until August.

1956: VP-42 again left San Diego on

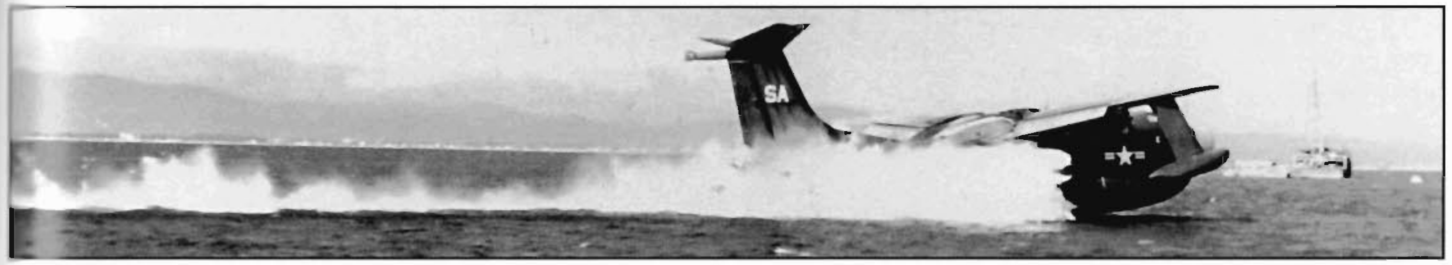


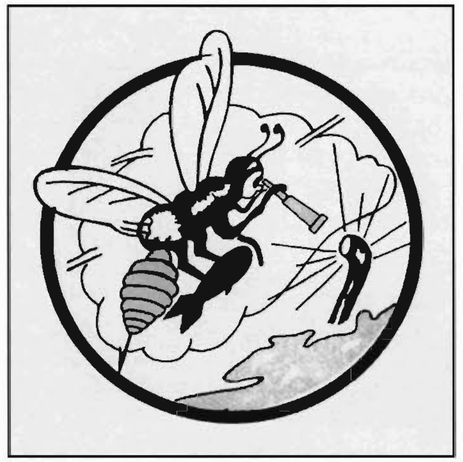
Above, VP-48 P5M-1 with toes in the water on 26 April 1955. (USN) Below, VP-42 P5M-2 takes on fuel at Sangley Point, PI, on 5 June 1956. (USN via Robert F. Dorr) Below, VP-42 Marlin is washed down with fresh water after returning to Sangley Point on 5 October 1956. (USN via Robert F. Dorr)

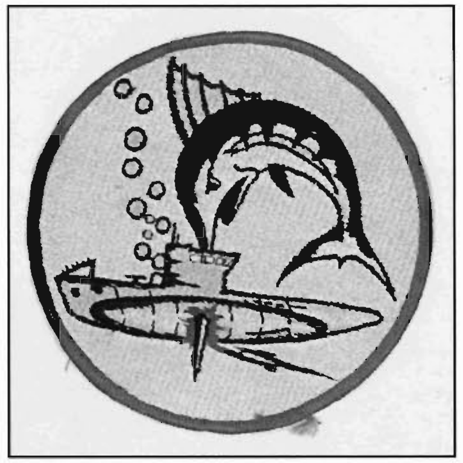


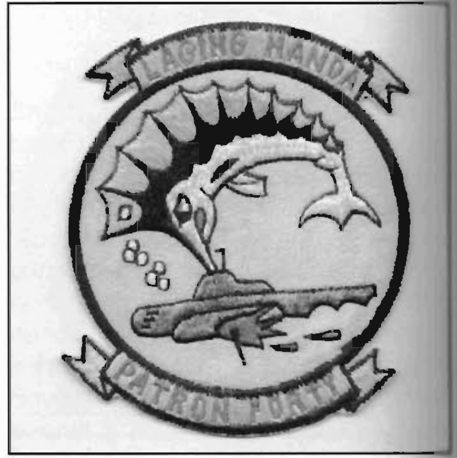


Below, VP-42 P5M-2 ("SA" tail code) landing at Sangley Point, PI, on 22 June 1956. (USN)

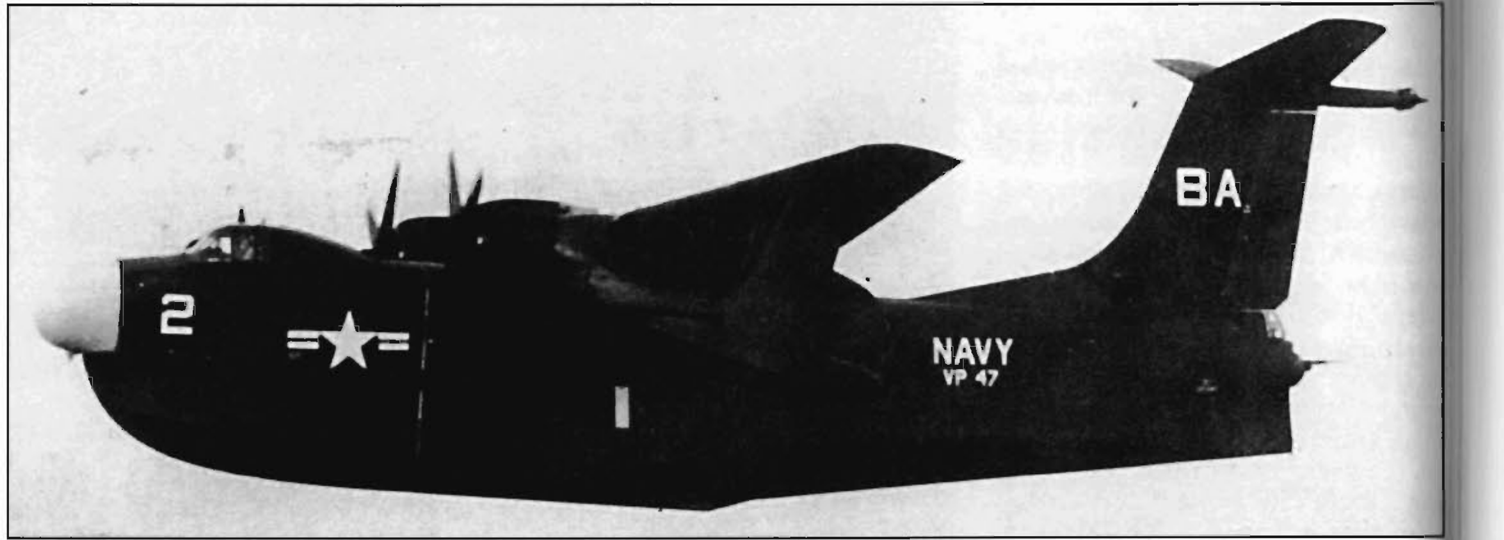


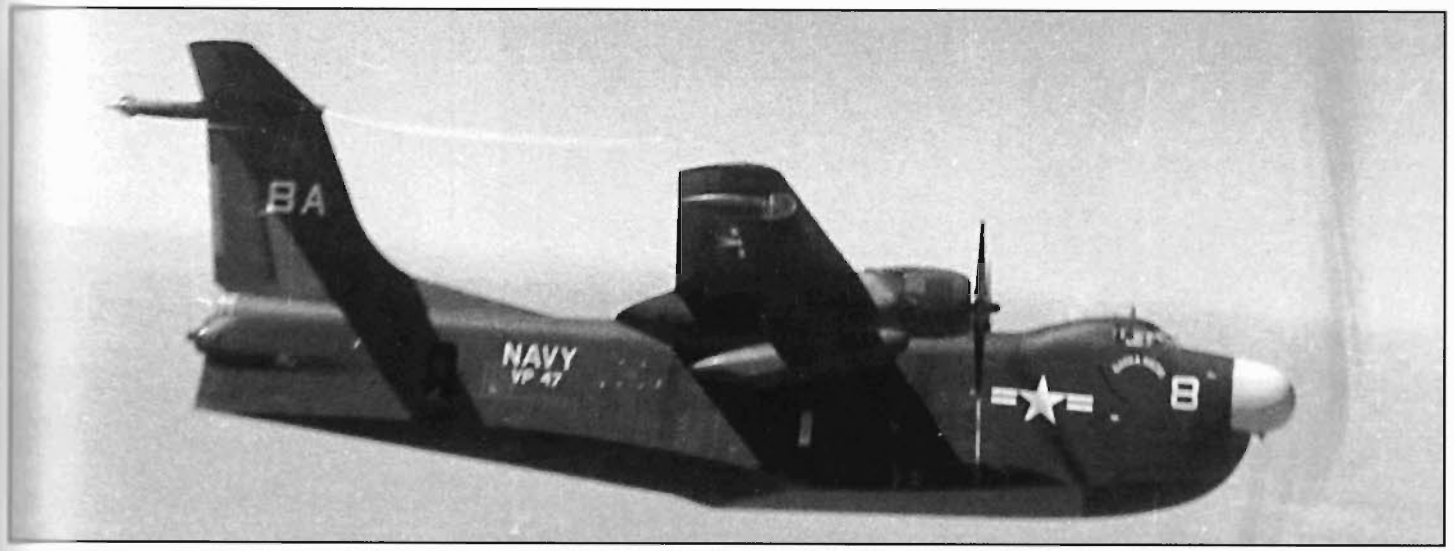






Above, 1954 VP-40 insignia. (USN) Above right, VP-40 1955-56 insignia. via Doug Siegfried) Above far right, 1957-to-present VP-40 insignia, (via Doug Siegfried) At right, VP-40 and guests witness a JATO take-off of their first P5M-1 from the seaplane ramp at North Island. (USN) Bottom, VP-47 P5M-2 on patrol from its base at Iwakuni in 1956. (USN)



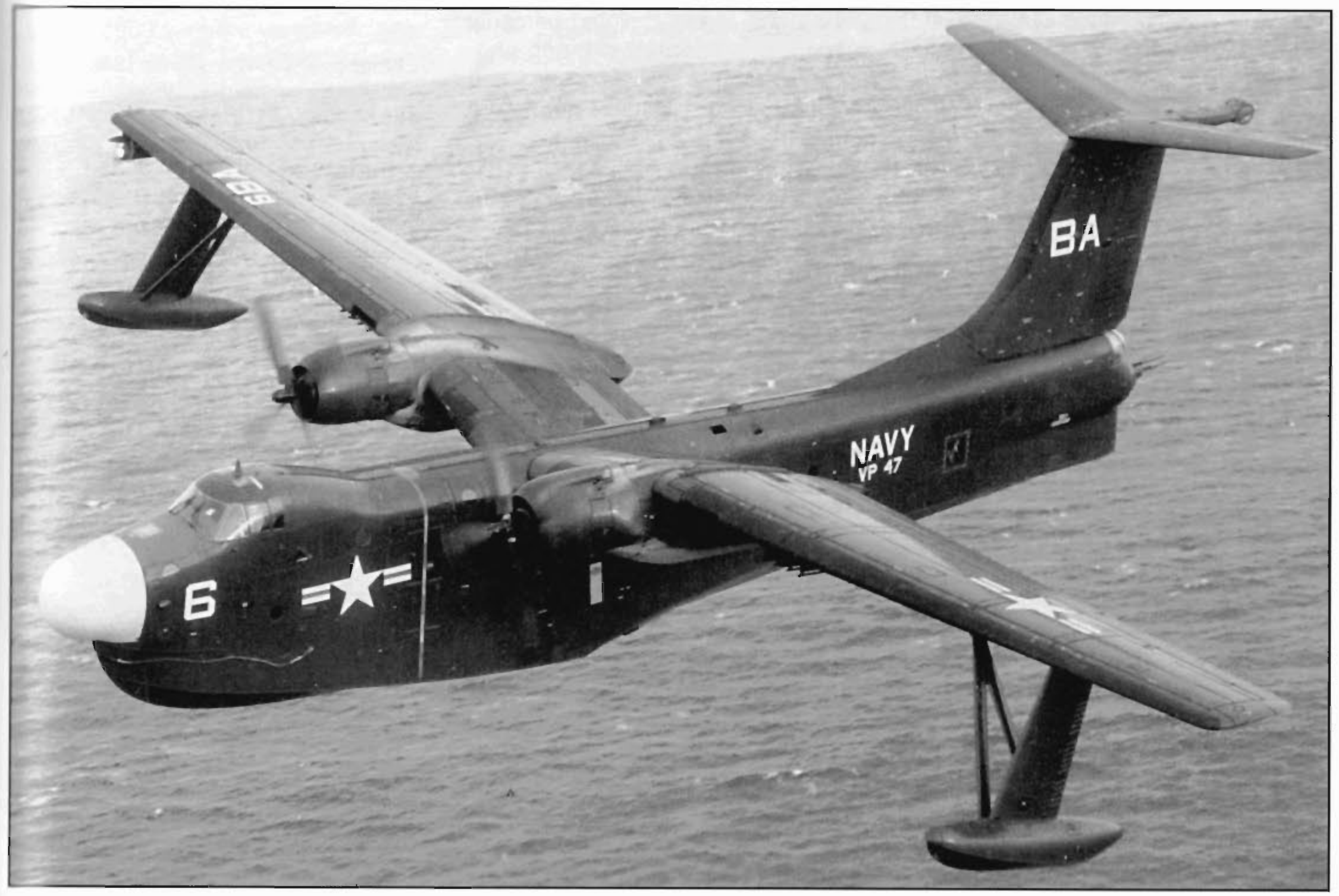


18 January 1956 for a Sangley Point deployment but altered the normal trans-Pacific routing by staging most of its aircraft through Midway Island instead of Johnston Island, although two aircraft went via Johnston. On 9 March, the small seaplane tender *Corson* was decommissioned. VP-48 began another deployment to Japan in May. On 3 May 1956, two VP-48 aircraft en route from NAS North Island to NAS Ford Island, Hawaii, were forced to ditch because of low fuel. One Marlin was taken under tow by a USCG cutter. The USS *Wasp* (CV-18) stood by the other until the Marlin was retrieved by the seaplane tender *Pine Island*. Both aircraft were returned to service. On 1 June, VP-50, based at Alameda, traded in its PBM-5S2s and became the last seaplane squadron in the Navy to convert to the Marlin. Upon completion of the transition, the squadron's permanent homeport was changed to NAS Whidbey Island, Washington.

__1957:__ VP-46 deployed to Sangley Point from March to July 1957. As the squadron transited through Midway Island, it became involved in the "Gooney Bird Experiment" conducted by the U.S. Fish and Wildlife Service. In a test of the homing instinct of the Gooney, the last two crews passing through Midway were given custody of four Gooney Birds apiece and released them further enroute at Kwajelein, Guam, and Sangley Point. All but one Gooney successfully found its way back to Midway. Besides the routine shipping surveillance patrols, VP-46's 1957 deployment was punctuated by visits to Singapore, Buckner Bay, and Boko To, and by participation in the mammoth "Beacon Hill Exercise", in which the squadron's mission was to seek out and conduct simulated attacks on the "opposition forces": fast carrier attack groups operating east of the Philippines. VP-42 relieved VP-46 at Sangley Point on 16 July 1957.

Besides performing the daily operational surveillance flights directed by Commander Fleet Air Wing One, VP-42 operated one or more of its aircraft from advance bases established by the Pacific Fleet's seaplane tenders at Buckner Bay in Okinawa, Boko-Ko in the Pescadores Islands and at Puerto Princesa, Cebu, Igat Bay, and Mangarin Bay in the Phillipines. A particularly interesting squadron operation was an eight plane detach-

Above, VP-47 P5M-2 in flight in 1955. (Jack Bradford via NMNA) Below, VP-47 P5M-2 off San Francisco in July 1956 with its original "BA" tail code. (Jack Bradford)



PATROL SQUADRON 47

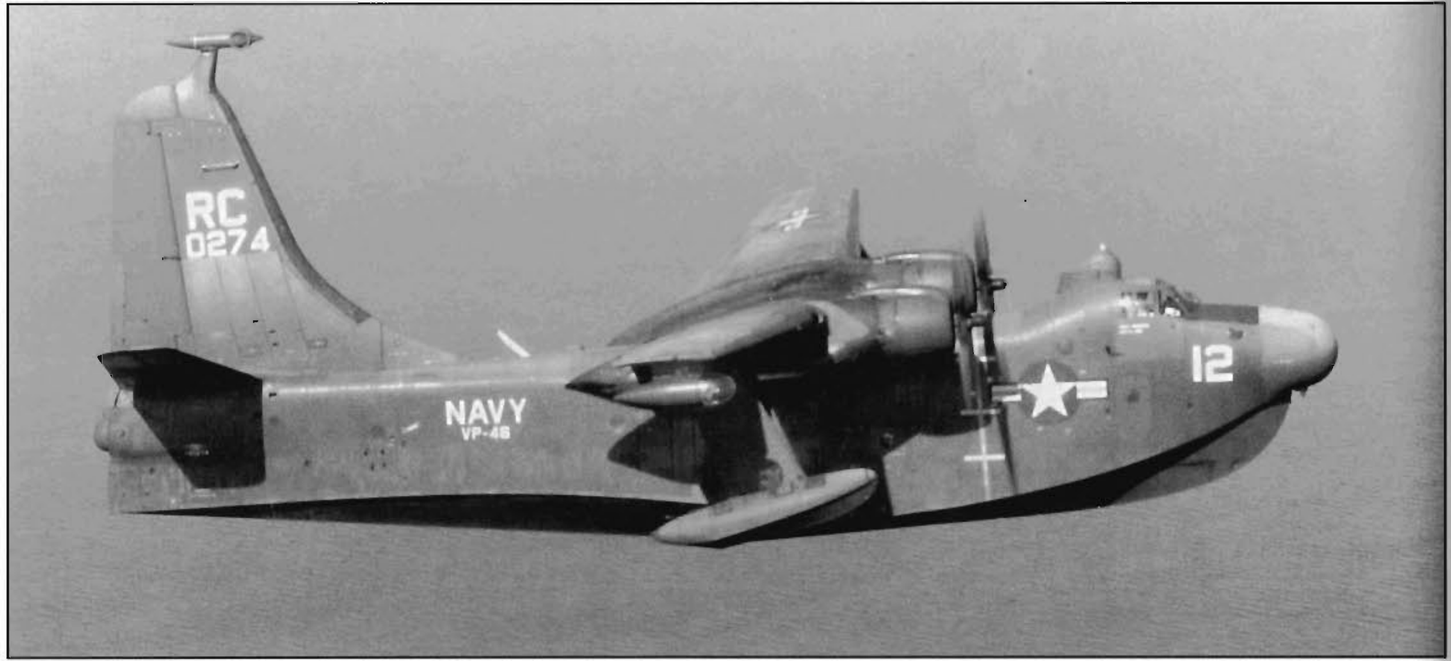
PATROL SQUADRON FORTY-SIX

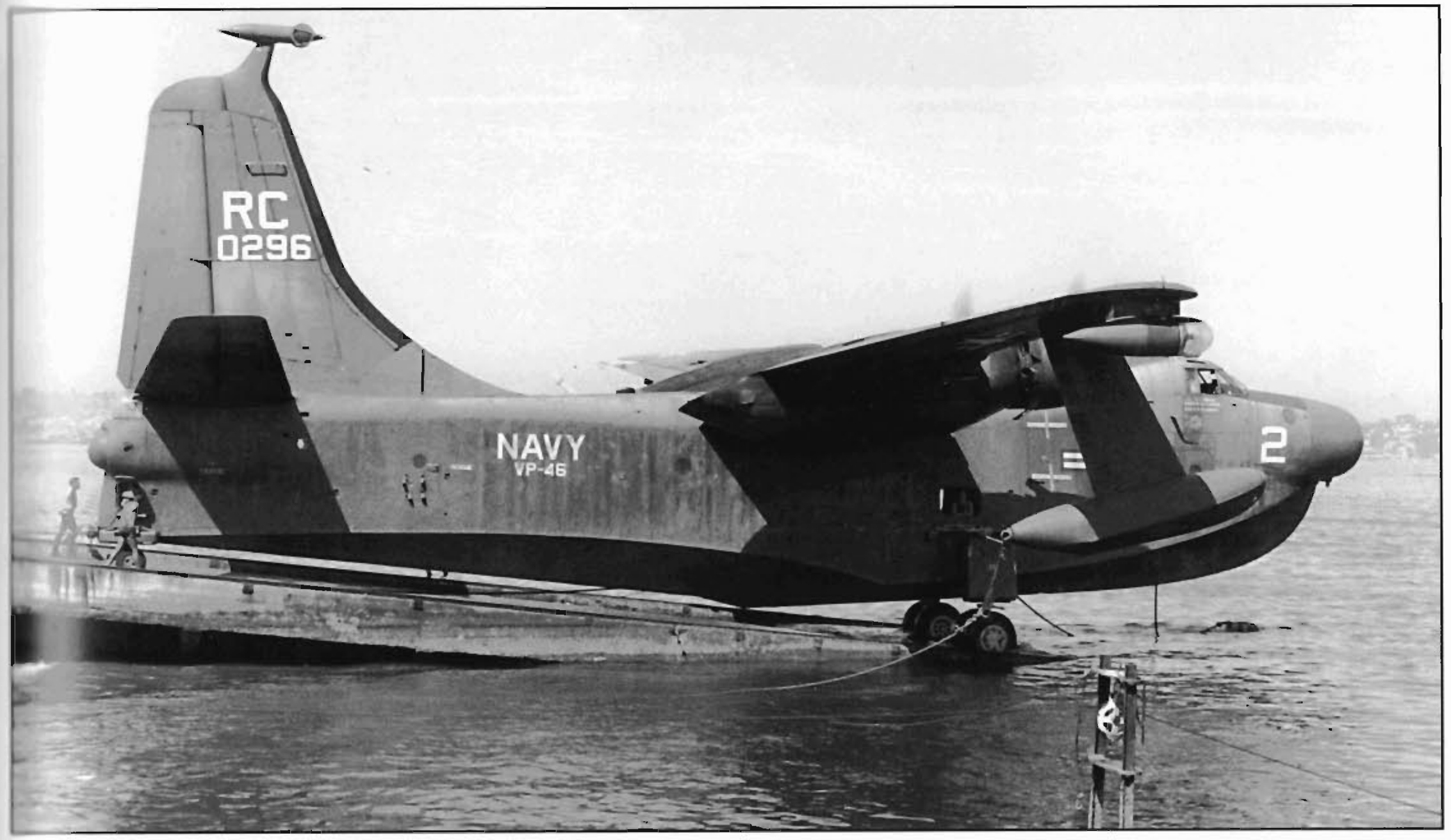
ment sent to Okinawa to participate in an exercise observed by Admiral Arleigh W. "31 knot" Burke, Chief of Naval Operations. Several aircraft carried paratroopers aboard which were dropped over exercise target areas-definitely an unusual employment of a flying boat. On 28 October 1957, VP-42 commenced movement of its aircraft to Puerta Princessa on the southern Philippine Island of Palawan for the largest scale advanced base seaplane operation since World War II. At this remote site the aircraft were supported by *Orca*, (AVP-49). After four days operating in these waters, all aircraft departed in a mass aerial formation for Mangarin Bay, a sheltered bay in Southern Mindoro, there to be tended by the large seaplane tender and flagship *Kenneth Whiting* (AV-14). While operations continued at Mangarin, *Orca* steamed to Cebu City on the island of Cebu and set up a seaplane operating area. In like manner *Kenneth Whiting* picked up its sea-drome and steamed to Igat Bay. Igat Bay is a remote bay carved into the island of Mindanao by the waters of the Sulu Sea. On 13 November all aircraft departed and the operation was secured officially after sixteen days of varied types of flights. Flights conducted included operational searches, local training flights including tender-controlled approaches, orientation flights for staff and ships' officers, and several flights devoted primarily to scouting out, surveying, and photographing other bays, coves, and sheltered waters suitable for future operations.

1958: 1958 was an operationally routine year for the Pacific Marlins. On 1 February, the small seaplane tender *Gardiners Bay* was decommissioned, continuing the drawdown of Pacific Fleet seaplane tender assets. In April, a VP-48 P5M-1, BuNo 130269, crashed upon take-off from Iwakuni. Eight crewmen were lost. In July, VP-40 deployed six aircraft to Bangkok, Thailand, and in September VP-46's P5M-1 BuNo 130304 sank after hitting a submerged object during a take-off from Boko-Ko in the Pescadores. No crewmen were injured.

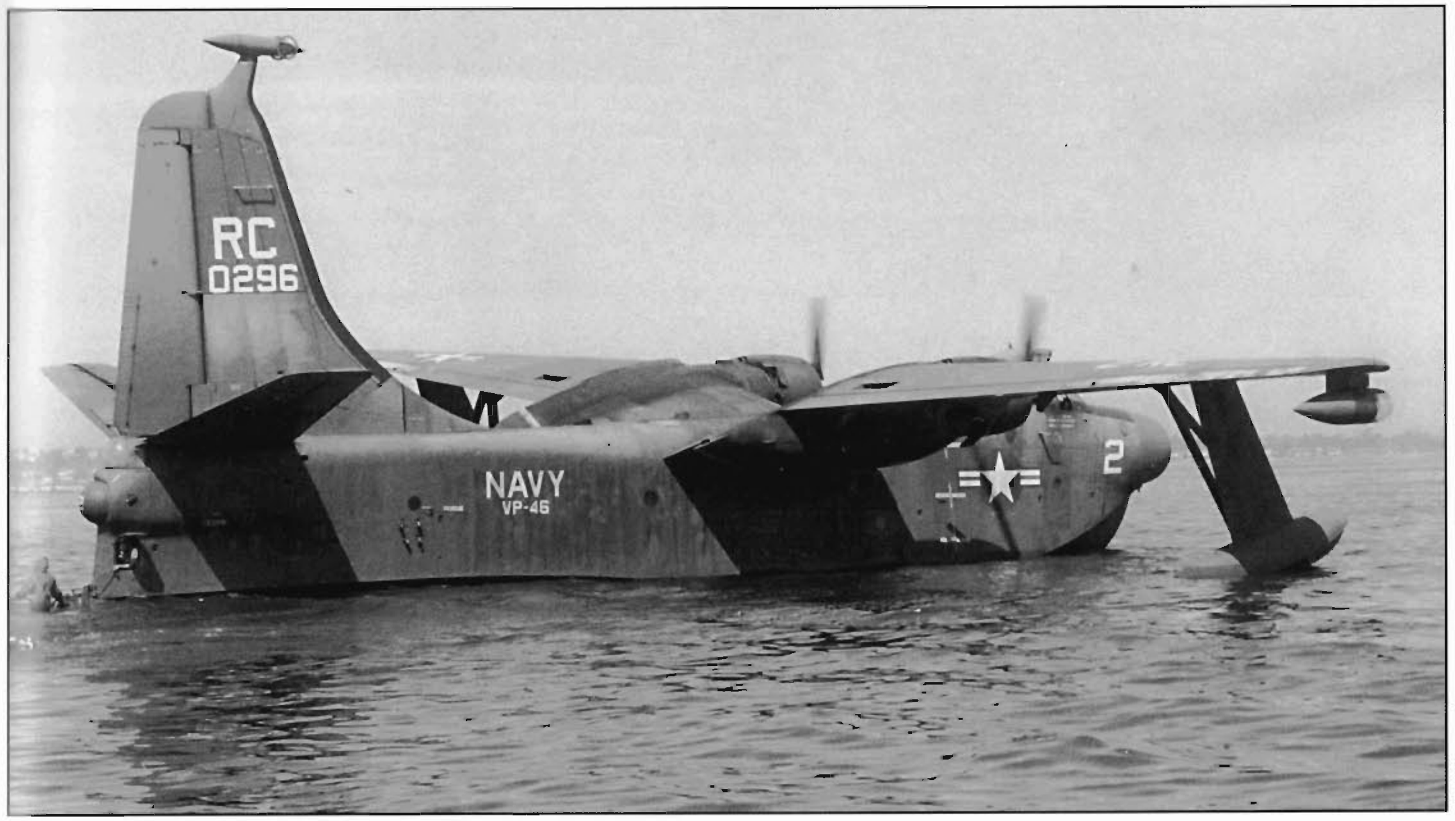
1959: 1959 was the worst loss year in Marlin history. Five crashes were experienced, one in the Atlantic and four in the Pacific. On 1 January 1959, VP-48 lost two crewmen when a training flight from San Diego in P5M-2 BuNo 135483 experienced an engine fire. Although eight men parachuted to safety, the two pilots were

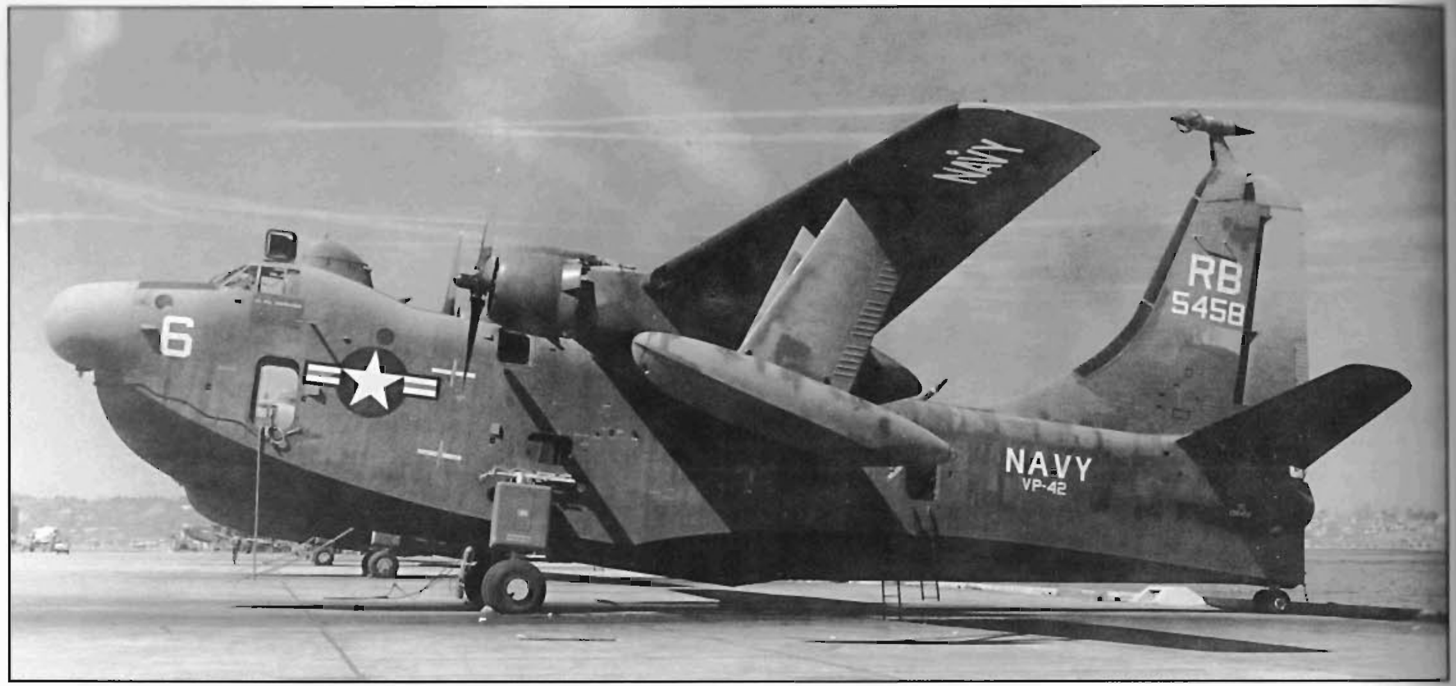
Left above, VP-47 insignia 1946-to-present. Above center, VP-46 insignia 1952-1955. At right above, VP-46 insignia 1955-1988. (insignia via Doug Siegfried) Below, VP-46 P5M-1 BuNo 130274 off San Diego on 19 November 1959. (LeCours via NMNA)





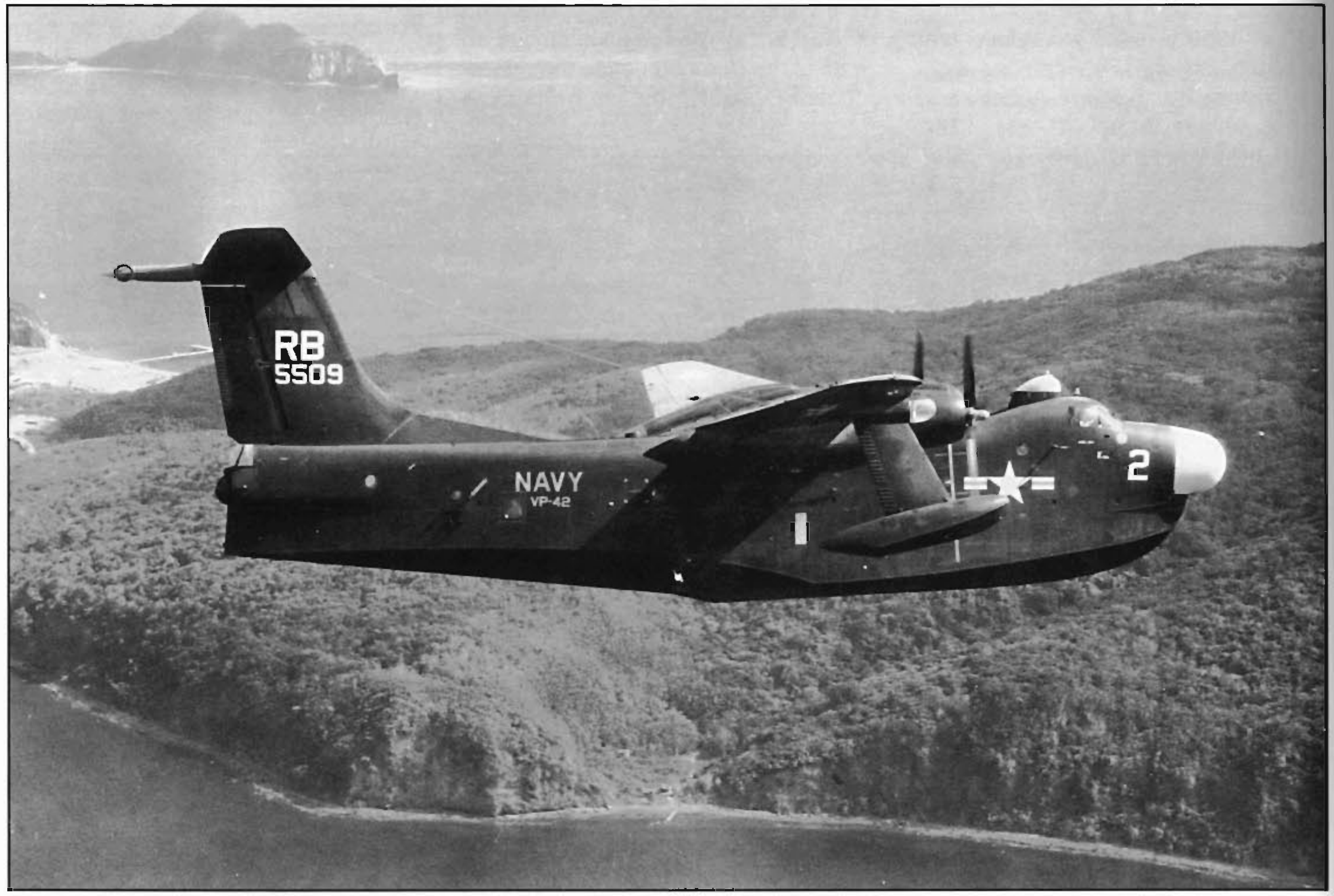
Above, VP-46 P5M-1 BuNo 130296 entering the water on 18 March 1960. (William Swisher) VP-46 P5M-1 BuNo 130296 after entering the water from the seaplane ramp at NAS North Island on 18 March 1960. (Doug Olson via NMNA)

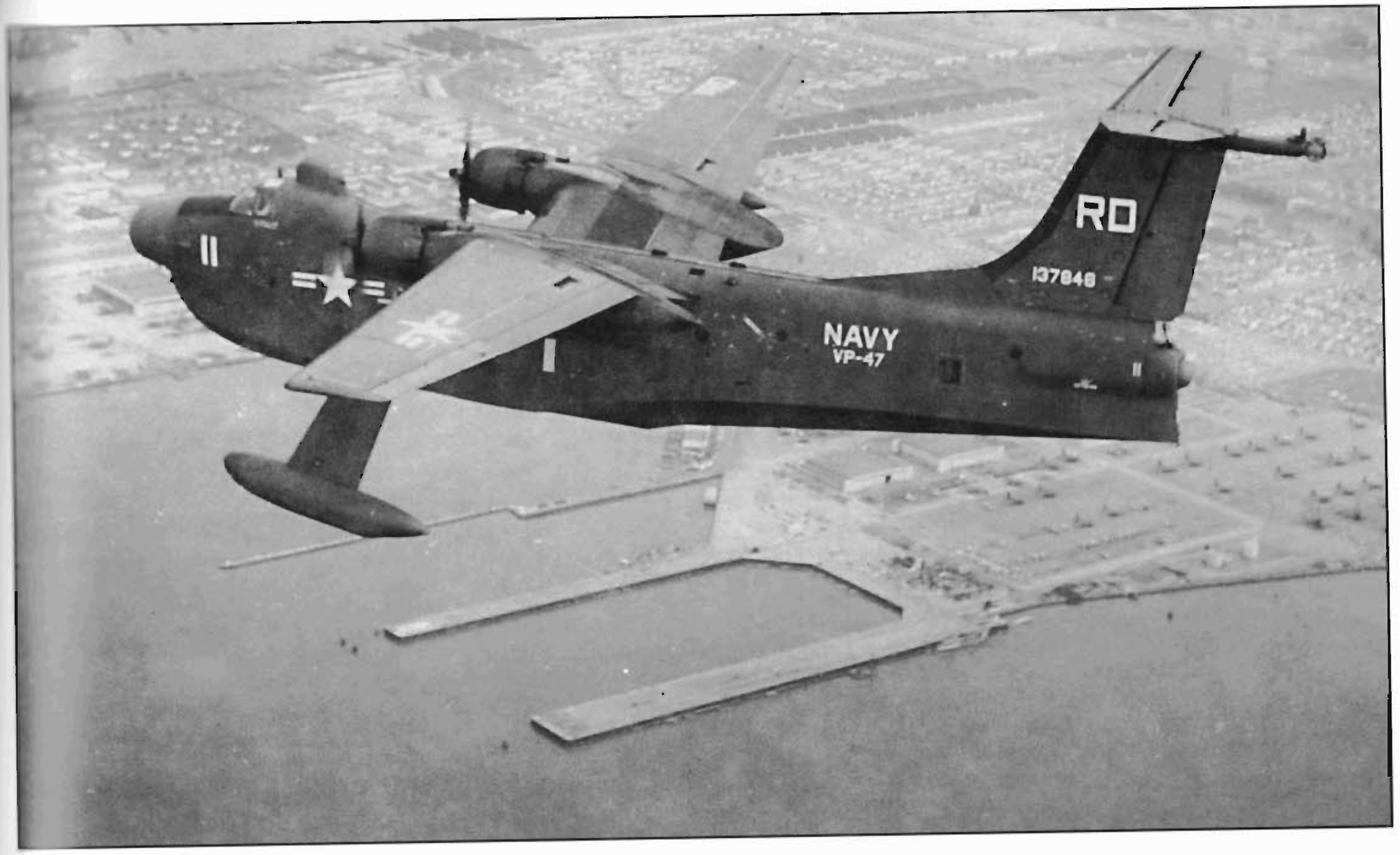




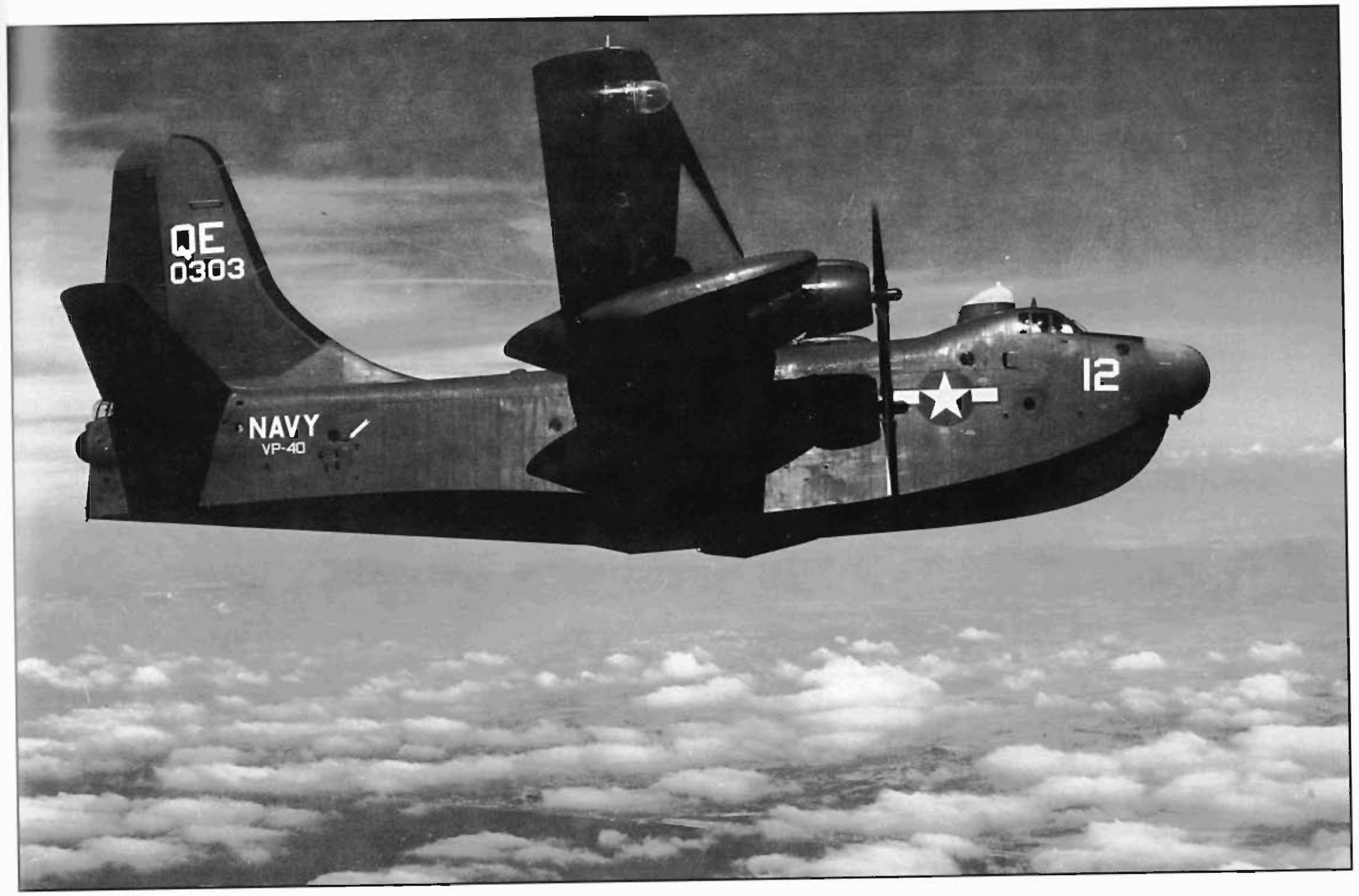
lost. On 9 April, VP-50's P5M-2 BuNo 135535 disappeared while on a patrol from Iwakuni, Japan, and 10 crewmen were lost. On 20 April VP-50's P5M-2 BuNo 130280 was preparing for a take-off from Sangley Point when a JATO bottle was fired inadvertently. The ensuing explosion and fire destroyed the aircraft and resulted in the deaths of four crewmen. 1959 brought a major change in patrol squadron deployment patterns.

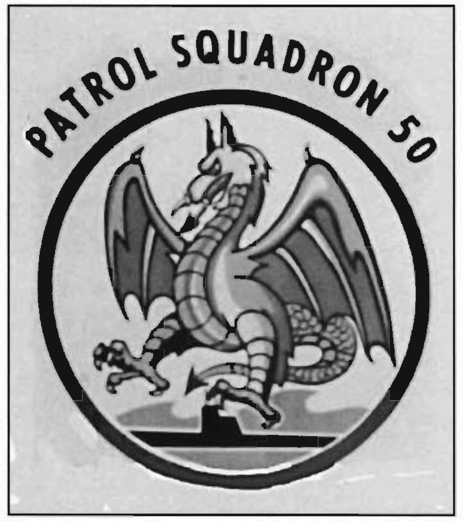
Above, VP-42 P5M-1 BuNo 135458 at NAS North Island, CA, on 18 March 1960. (William Swisher) Below, VP-42 P5M-2 BuNo 135509 over the Philippine Islands in November 1957. The upper side of the wing was painted white. (USN)

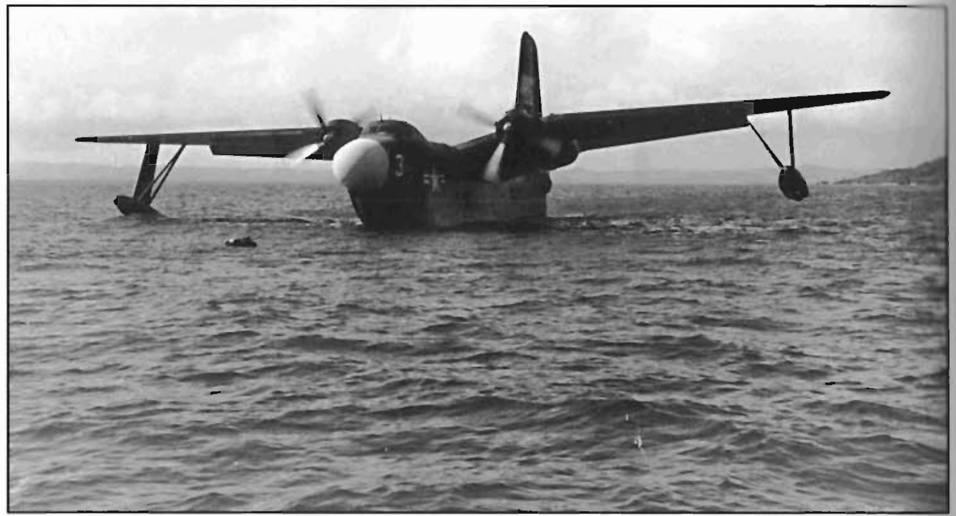




Above, VP-47 P5M-2 BuNo 137846 over Alameda, CA, in late 1957. (Jack Bradford via NMNA) Below, all-blue VP-40 P5M-1 BuNo 130303 in flight. Note tail guns have been removed. (USN)



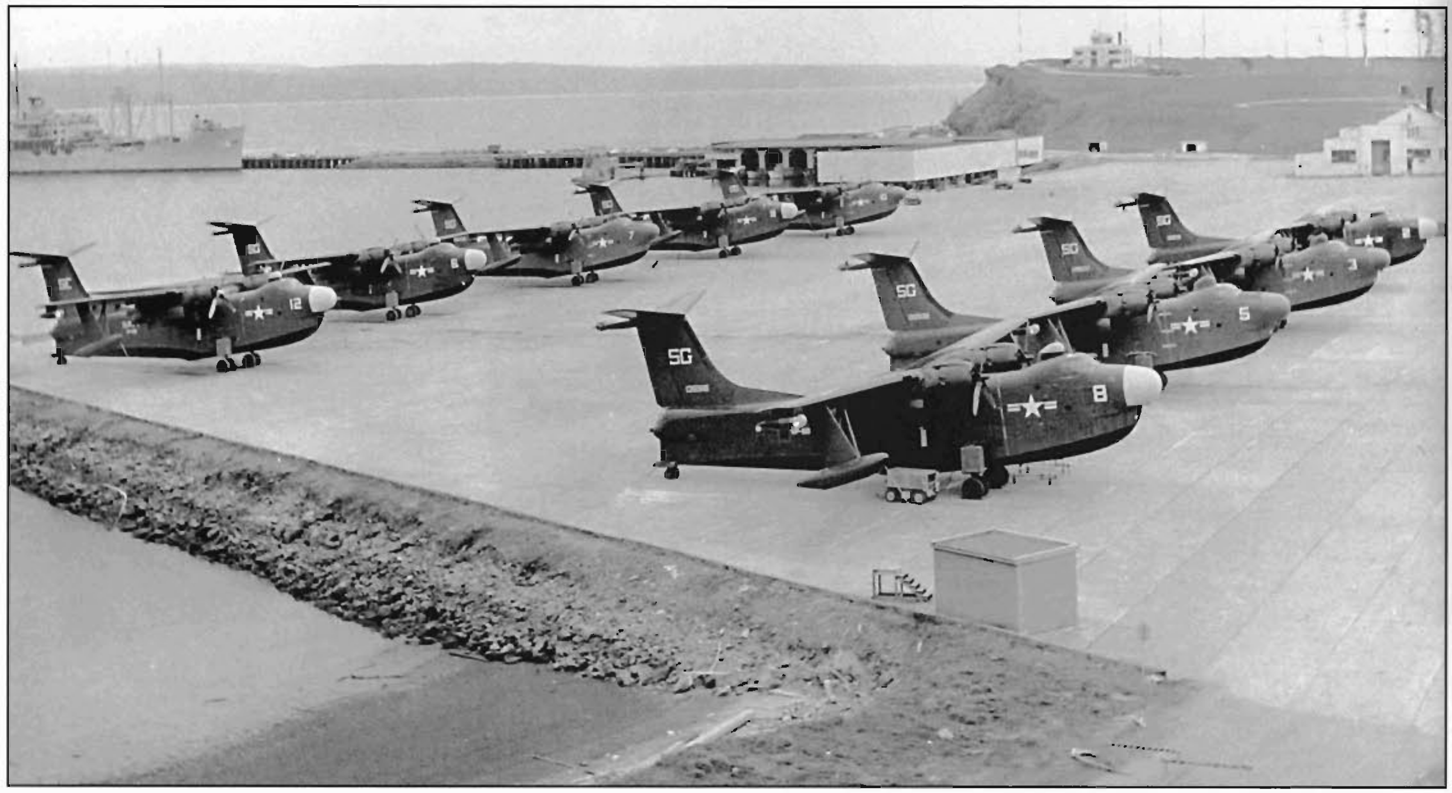


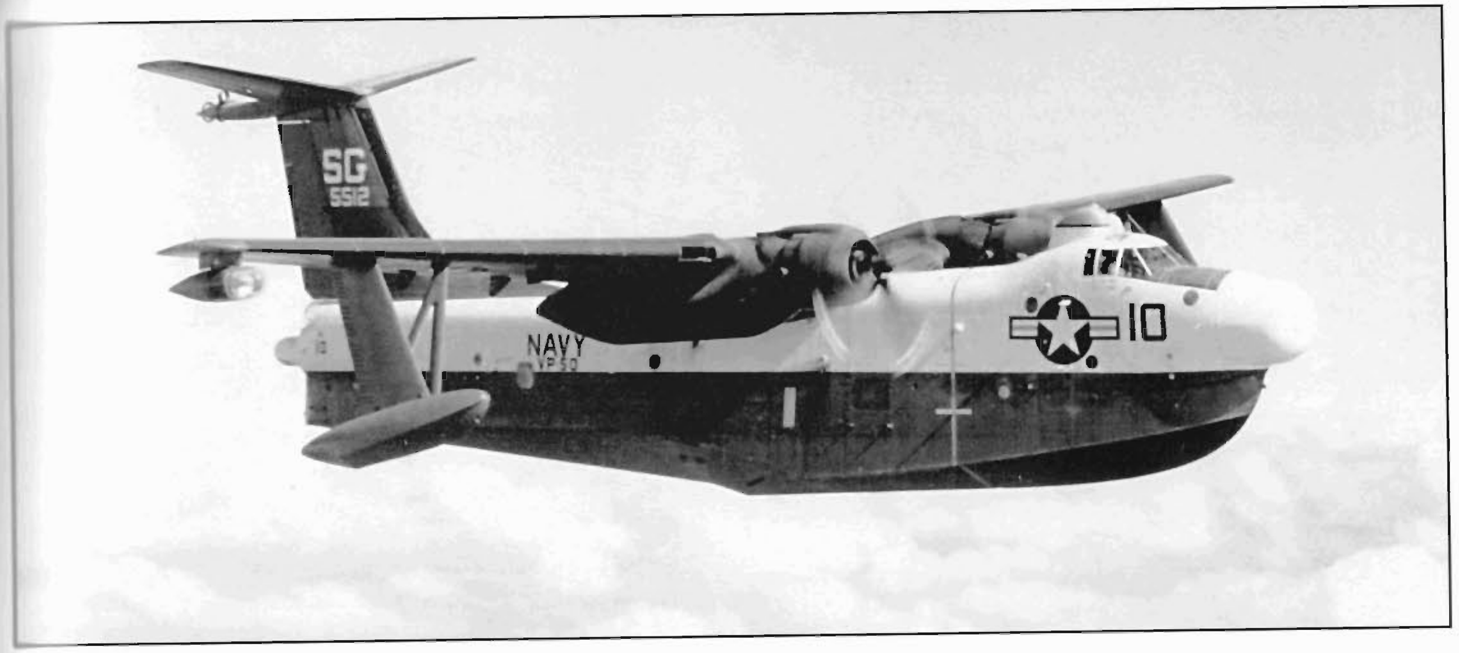


VP-40 was assigned to a permanent homeport at Sangley Point on 1 August. This assignment not only decreased the overall requirement for seaplane squadrons, it meant that VP-42 and VP-46 would no longer have to make the arduous trans-Pacific deployment flights every six months. But even when flying from stateside bases, Marlin duty entailed risk. Don McCloskey recalls: "On 25 Sept 1959, I was co-pilot on P5M-2 BuNo 135540 that was on a routine rigging mission off the Oregon coast. With startling rapidity, we had a fire in the number one engine, combined with a loss of electrical power, low altitude, over single-engine weight, and terrible weather. Fired both fire bottles, but to no avail. The plane was ditched in 8-10 foot seas, but thanks to our pilot, LT Jim Henson, the landing was made "into the wind, parallel to the swell", just like the book prescribed. All crew members exited the burning aircraft from the right rear side, but not before they threw all the survival gear into the water. I believe we all swam for about 30 minutes before we got the first raft open and I crawled in. In my memory, I can still see crew members in the water in a line that extended some 100-200 yards. Down at the far end of the line, other crew members got the second raft open, and between us, all crew members were picked up and in the rafts. There is a lot more to the story but suffice to say that all ten of us spent 30 minutes in the water, then about twelve hours bailing furiously in our rafts, before being rescued by the Coast Guard cutter *Yacona* out of Astoria, Oregon."

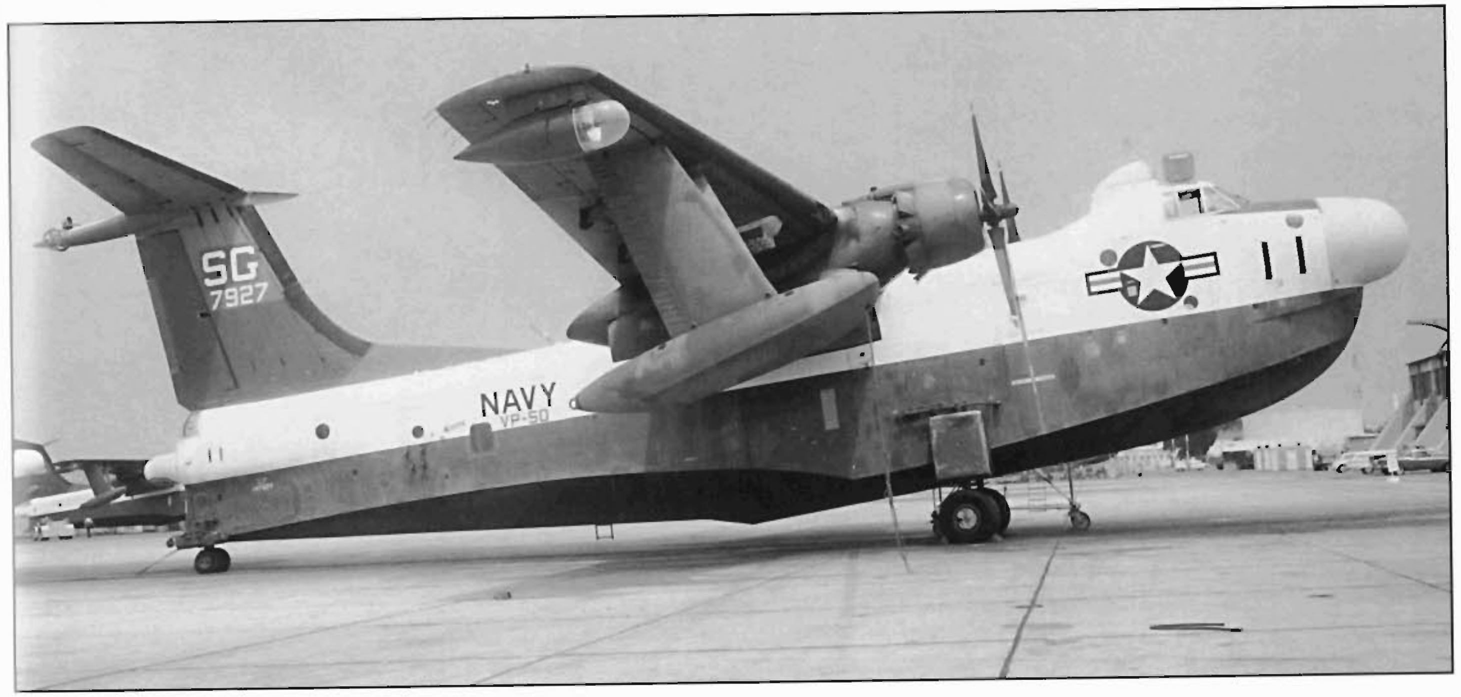
1960: On 11 February, VP-50's P5M-2 BuNo 135498 crashed during a rocket firing training flight out of Whidbey Island with the loss of nine crewmen. The aircraft lost a wing when a rocket exploded as it was being launched. 1960 continued the redeployment of the Marlin squadrons. On 1 April, VP-50's homeport was changed from NAS Whidbey Island, WA, to MCAS Iwakuni, Japan. This assignment relieved VP-47 and VP-48 from the requirement to make Far East deployments and further reduced the need for seaplane squadrons. With two squadrons now permanently based in the Orient, there was a requirement for Marlin depot-level maintenance in the Far East. Consequently, a contract was given to Shin Meiwa Aircraft of Konan, Japan, to do heavy maintenance on the Marlins. Shin Meiwa was the successor to the Kawanishi Aircraft Company which had designed and built the very successful Mavis and Emily flying boats for the Imperial Japanese Navy. In February and March the small seaplane tenders *Floyds Bay* and *Orca* were decommissioned. With the transfer of *Currituck* to the Pacific Fleet in December, Pacific tender assets were now only the three *Currituck* class AVs: *Currituck*, *Pine Island* and *Salisbury Sound*. On 14 July a Northwest Airlines DC-7 was forced to ditch about 180 miles ENE of Manila. 57 survivors were rescued by two Marlins of VP-40. In August of 1960 the home port of VP-47 was

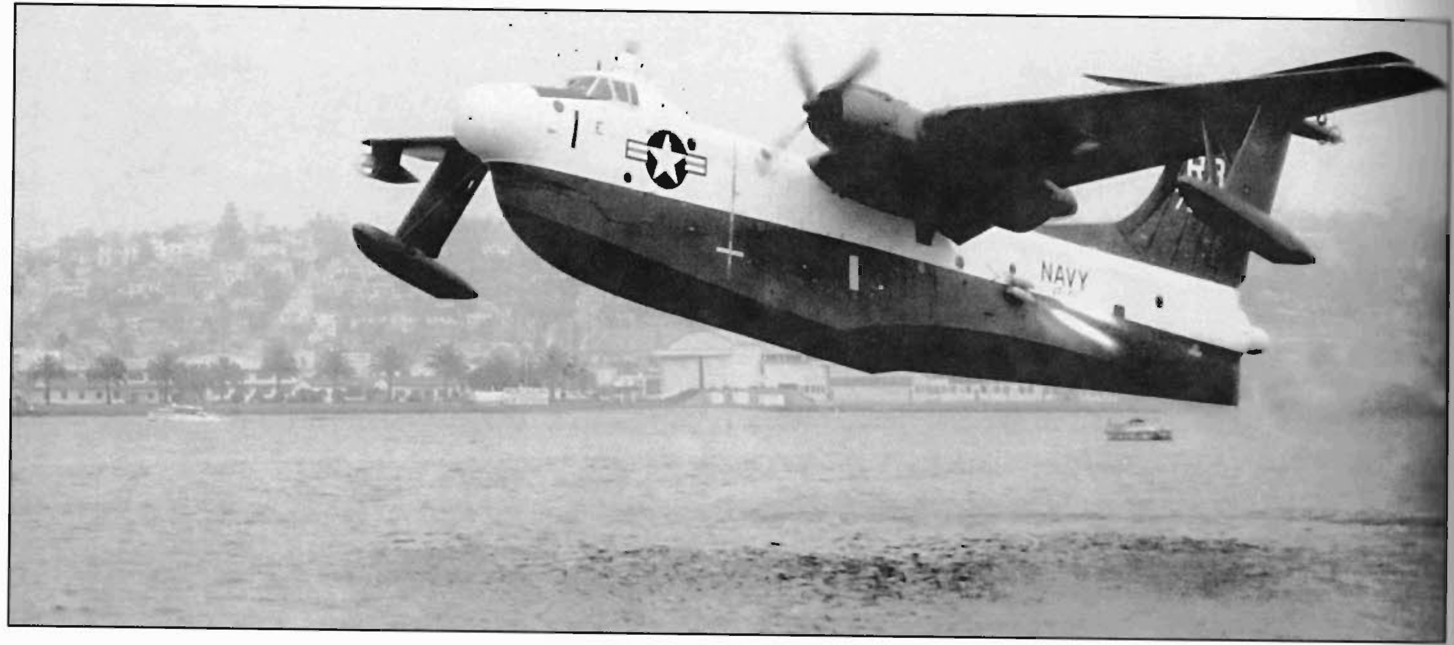
Above, VP-46 P5M-1 with early "BD" tail code approaches seadrome buoy. (USN) Below, nine all-blue P5M-2s on the VP-50 ramp. (USN)





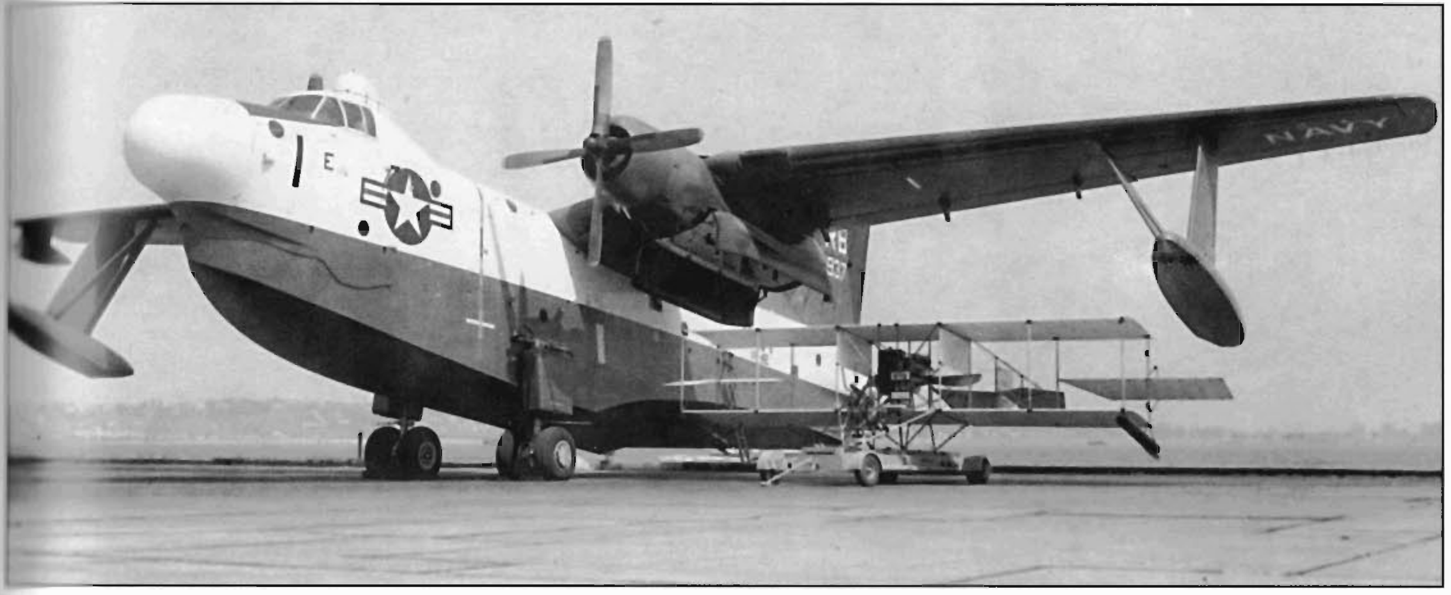
Above, VP-50 SP-5B BuNo 135512 off San Diego. (USN) Below, VP-50 SP-5B BuNo 147927 at North Island on 12 June 1965. (Doug Olson via NMNA)





VP-42 P5M-2S BuNo 147937 conducts a JATO take-off from San Diego Bay on 20 August 1961. (USN)

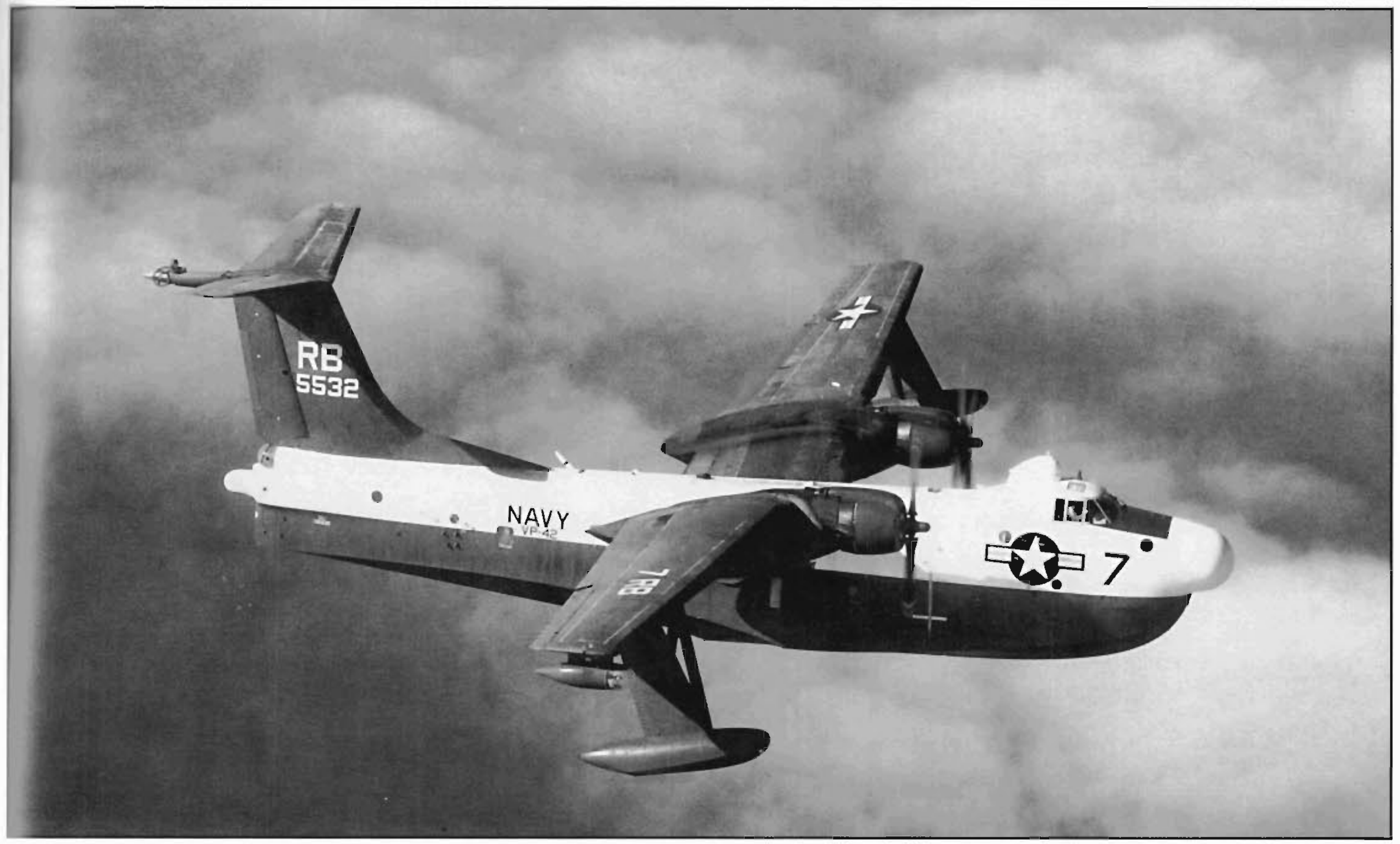
RB
7937
1141



Above, VP-42 P5M-2 BuNo 147937 at North Island with a replica of the Navy's first airplane, the A-1 Triad, on 20 August 1961. (USN) Below, VP-42 SP-5B BuNo 135532 in flight. Note wing codes. (USN)

changed from NAS Alameda, CA, to NAS Whidbey Island, Washington. While Alameda was a wonderful base and had been used by flying boats since the days of the China Clipper, a recent increase of driftwood and debris in the seadrome had greatly reduced its utility. The debris hazards had increased to the point that daytime training and operational flights had to be curtailed and night flights eliminated.

In 1999, writing for the TOTAH Chapter Newsletter, RADM Bruce A. Black gave a fine overview of Marlin activities out of Iwakuni for the era. Admiral Black wrote: "In 1960, we were in the middle of the "Cold War." As the Intelligence Officer in Patrol Squadron 50 (VP-50) flying out of Iwakuni, Japan, I often flew as a technical observer with the crews of our Martin Marlin seaplanes on long 12 hour-plus patrol flights over the Sea of Japan, off Korea, and over the Yellow Sea along the coast of



RD
135474
NAVY
VP-47
10

Above, VP-47 P5M-2 BuNo 135474 in flight. Note location of underwing codes. (USN) Below, VP-47 SP-5Bs in flight with BuNo 140149 in the foreground. (USN)

Communist China. We and other Navy patrol squadrons based out of Japan and Okinawa were trying to monitor the communist shipping plying the waters between Vladavostock, North Korea, and the Chinese ports to the south. We did this by “rigging” the merchant marine traffic on a daily basis. Rigging consisted of photographing and tracking the vessels and trying to monitor various cargoes, and identifying ship types like freighters, oilers, transports, and freighter-transports. We tried to estimate their gross tonnage and whether they were loaded or in ballast, which gave us an idea of what was going where in that part of the Communist world.

“Additionally, we had a more serious job of trying to spot and track submarines both visually and with sonobouys. If we could catch them on the surface or snorkeling, we would photograph them for identification and other intelligence purposes. We were also in the business of recording electronic emissions from the communist early warning and fire control radars, and other electronic communications located in North Korea, the USSR, and Communist China.

“In those days, the cold war infrequently (but all to often for the crews of the reconnaissance flights involved) got “hot” when our unarmed reconnaissance aircraft were fired on. Too many times the aircraft just “disappeared” after reporting they had been jumped by fighters scrambled from the mainland. Only scattered wreckage was usually found. Being jumped by fighters was not good news, but fortunately it would usually be followed only by unfriendly “fly-bys” or an unwanted fighter escort out of the area — but you never knew.

RD
140149
NAVY
VP-47
3
9

RC
6490
NAVY
8

Above, rocket firing VP-46 P5M-1 BuNo 126490 in flight on 4 November 1960 with J.D. Skidmore in command. (USN) Below, 126490 overflies a freighter on 4 November 1960. (USN)

“We were jumped twice during my flights with the crews of VP-50. Both of these happened in the East China Sea off Shanghai and just outside of the international 12-mile limit. Like most young pilots and crew men doing a job they knew was important, we often pushed the limits. The first time we were jumped, it may have been one of those times. We were in close enough to see Shanghai and the coast of China. We had spotted an old British made Flower Class patrol boat at or near the 12-mile limit. We maneuvered to get the best photos we could of it, but the ChiCom ship would have none of it. He “S” turned hard to keep his bow toward us as we maneuvered violently to get the desired profile shot.

“This game went on for about five minutes until we saw little white puffs of smoke coming from his front gun mount. Probably warning shots - but we were not sticking around to find out and we didn’t consider it fun being shot at in peace time. We dove for the deck and started to hi-tail it (if you can call 200 knots in a lumbering seaplane fast) out of the area. I climbed into my favorite seat in the rear gunner’s position where I could get a good going away view of the fading coastline from the unarmed rear bubble.

“Several miles out, we began climbing for altitude and that’s when I

RC
6490
NAVY
8
CALMAR LINE

Above, VP-48 P5M-2S BuNo 135493 off San Diego in April 1960. (USN) Below, VP-42 P5M-2S BuNo 135534 taxis off San Diego in March 1961. (Ed Baumgarden via NMNA)

RB
5534
NAVY
VP-42
7
7RB

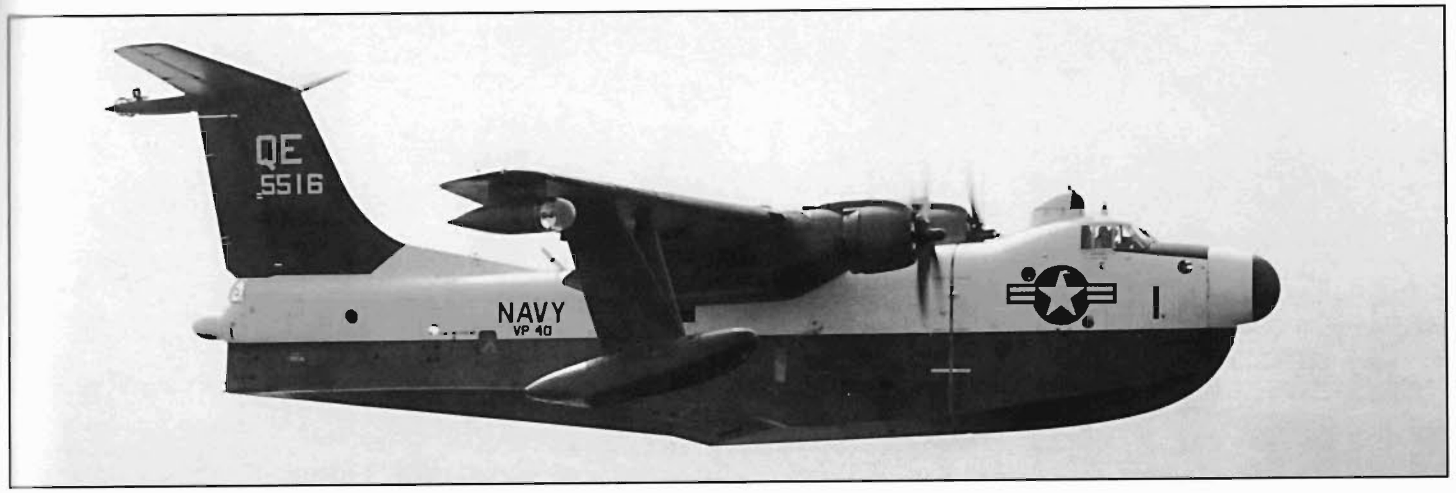
Above, in 1961 VP-47's CO took his Marlin to Kodiak, AK, to explore the feasibility of basing P-boats there. (USN) Below, VP-40 SP-5B BuNo 135516 on patrol. (USN)

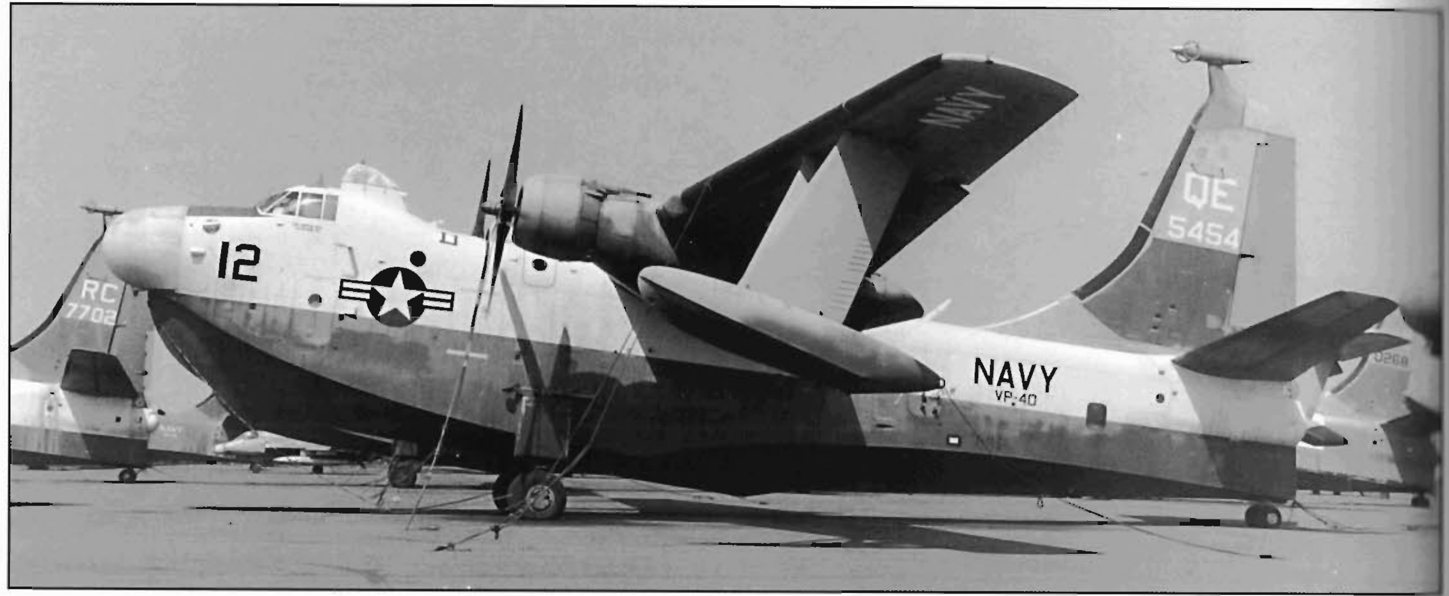
got one of the great shocks of my life. There were two specks several miles behind us at six o'clock high and closing fast. I started screaming into the intercom that we were being intercepted, but was met with dead silence. At first, I thought everyone was shocked into silence, but then realized I had not pressed the mike button (located on the deck) with my foot. After almost ramming my foot and the mike button with it through the aluminum decking, I announced in the calmest voice I could muster that we had two "Flashlights" on our tail. Again a short silence followed by 'Ensign Black-are you sure?'

"By now they were about 1000 yards behind us, coming in fast, and spread out 100 yards apart with the sun glinting off polished aluminum engines and wings. There was no mistaking the Russian YAK-25 twin engine fighter jets with the high "T" tail. I reported 'Yes sir- I'm sure!' They were coming up fast and looked like they were either going to make a firing run or go by us on both sides. Again a short silence, then the pilot ordered everyone to get their chutes on, check their Mae Wests and survival gear, and be prepared to jump or ditch if he opened up on us. Boy did that get my attention!

"We were flying straight away from the coast about as fast as a turtle crawls. Nothing to do then but wait and see what their intentions were. I was damned happy when I recognized they weren't lined up directly on our tail — and me. They flew by us on either side about 200 knots faster than we were going. Talk about feeling naked! I felt like I was in the water with a couple of sharks looking me over before taking the first bite. They pulled up and make a turn to port and then came back down our port side flying close formation on a second pass. If I hadn't been so scared, it would have been a beautiful thing to watch. Then they turned to port again and headed back to China. I don't know when I have ever been happier to see unwanted visitors leave than that day. In all the tension and excitement of the moment, no one thought to get photos and we all felt stupid - particularly me; the squadron Intelligence Officer. After we got back and I had finished the debriefing, P.I.'ed the rigging photos, and finished all the mandatory reports, it was well after midnight. I slept like a newborn baby that night.

"A month later, I got to take some photos. This time we were jumped while we were trying to get "Elint" by flying low off the coast and then pulling up fast to catch the radars and other signals before they turned them off. Again, I was in the tail and sighted a speck at our 4 o'clock high and closing. This time, it was a lone MiG 15, but it came around to our six o'clock and slowed till it seemed to just be hanging on our tail about 100 yards out. At that distance, the cannons in the nose looked like a double barrel shot gun at 10 feet staring me straight in the face. The aircraft was dead behind us and there was nothing between him and me, but a quarter inch of Plexiglas. I tried to smile at him. Since that first intercept a month earlier, I had time to think about my own mortality and about my 8-month pregnant wife who had just joined me in Iwakuni from the States. I felt fear,





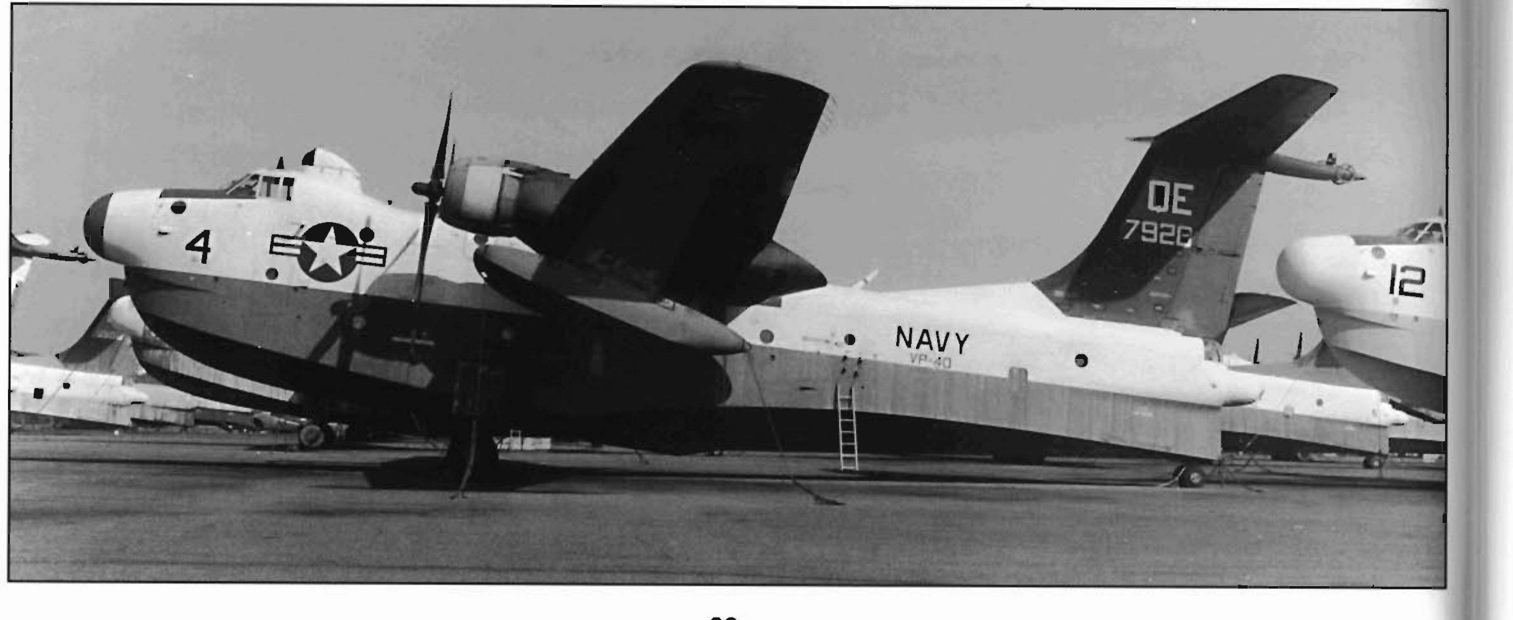
not so much for me, but fear for her and my unborn child if I didn't come home. A very different reaction, but every bit as sobering.

"Then I could see the MiG put down his flaps as he was still overtaking us. He moved outboard and flew up our starboard side only fifty feet out. His nose was high as he tried to keep from falling out of the sky; at what for him was a very low speed. Not about to miss the "photo op" this time, I was taking pictures like mad with my own 35 mm camera while the crew was using the big hand held K-20 camera. I waved at him, which was about the only defense we had, and he waved back. For a second or two, two humans from truly different worlds said "Hello" in the only common language we both understood. He flew on by us, retracted his flaps, wiggled his wing, and when we turned away from the coast he moved out several thousand yards, where he shadowed us for another 10 minutes before he left for home.

"I got a great picture of the aircraft in profile and you can see the Chinese pilot waving. You can count all five of his fingers on his gloved right hand. I would love to meet him now, and talk to him about his thoughts in those days and what his orders were if we had pushed it."

1961: On 31 January, the beginning of the end for Pacific Fleet Marlin squadrons was signaled when VP-46 received its first P2V Neptune and began the transition to a landplane squadron.

VP-40 low-tail Marlin BuNo 135454 (above) on 25 August 1962 and high tail Marlin BuNo 147926 (below) on 28 January 1967 at North Island. (William Swisher / Larry Smalley)

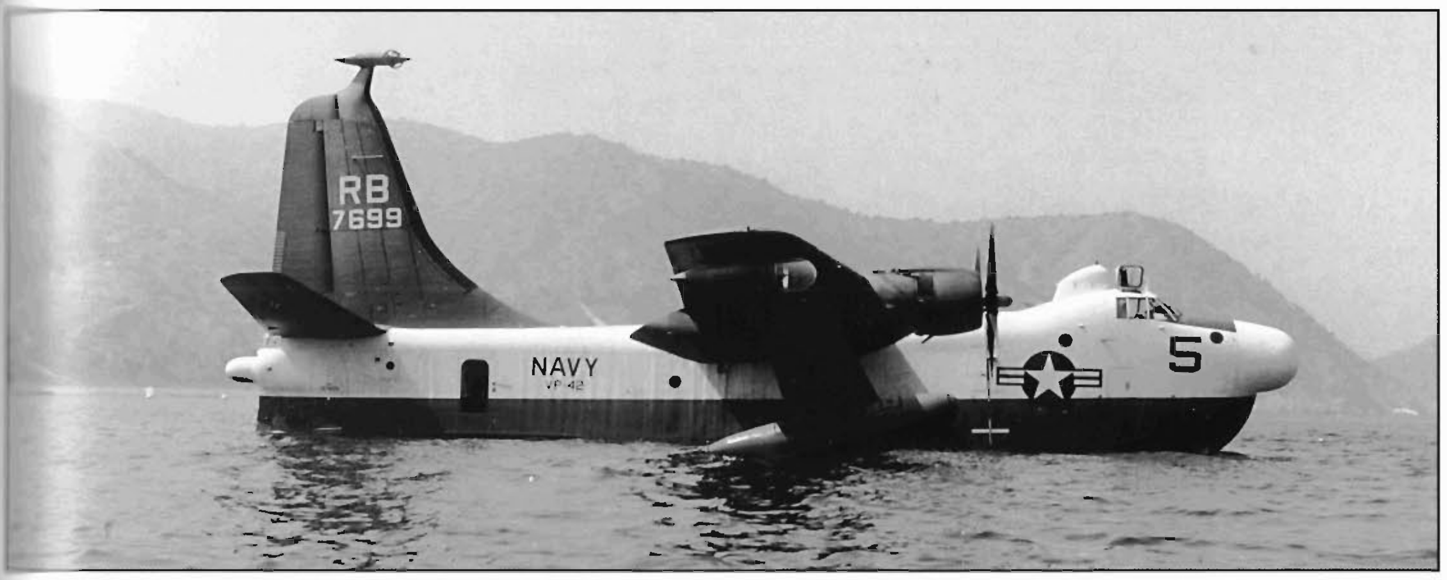


Salisbury Sound relieved *Pine Island* as a unit of the Seventh Fleet on 1 April. During this deployment, the ship performed the primary mission of providing an advanced base for seaplane squadrons and served as flagship for the Commander, Taiwan Patrol Force. Most of the ship's operations were conducted in Buckner Bay, Okinawa, where units of VP-40 and VP-50 were supported. On 27 June 1961, *Currituck* began her first Pacific tour, relieving *Salisbury Sound.*

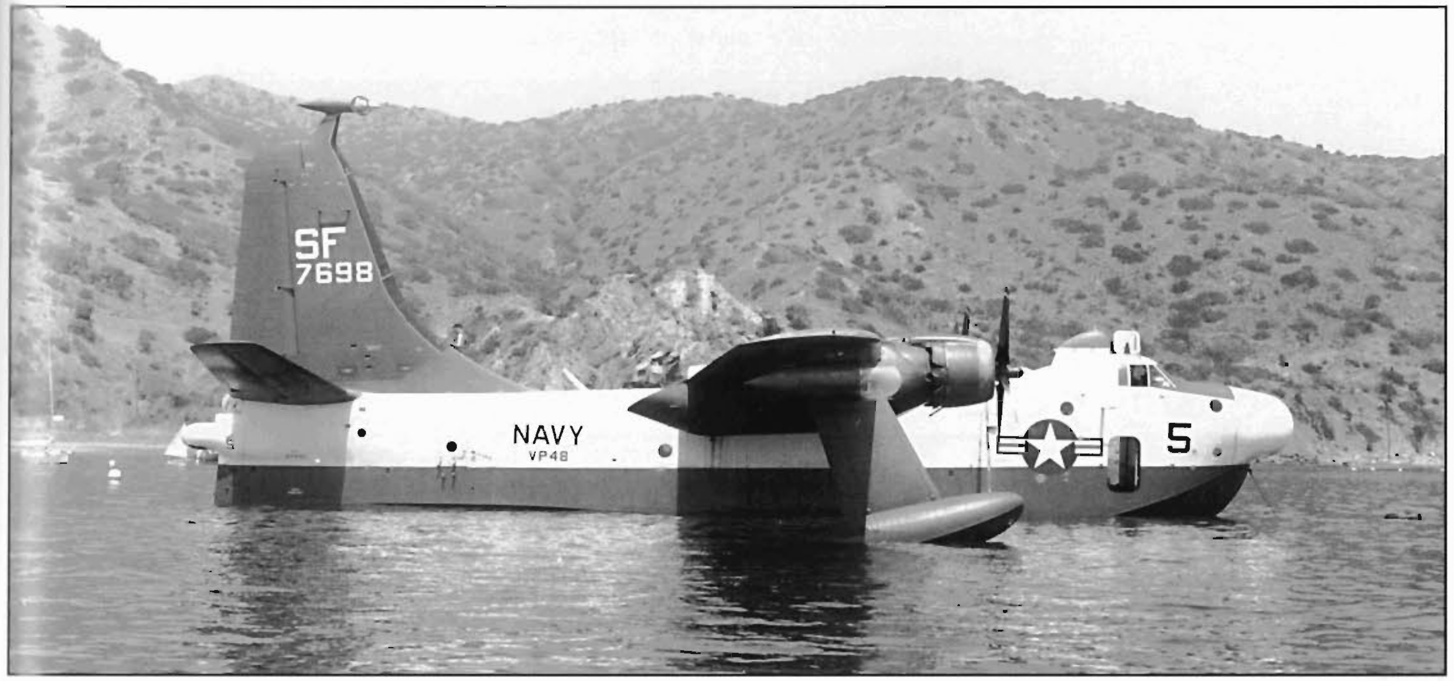
With the requirement for Far East rotational deployments removed, the remaining stateside-based Marlin squadrons began to explore new mission areas. In August, the CO of VP-47 made a survey flight to NAS Kodiak, AK. On 6 November, the *Salisbury Sound* established a seadrome at White Cove, Santa Catalina Island, CA, and operated with P5Ms of VP-42 for three days. Other tender exercises of short duration were conducted with VP-48.

1962: In May of 1962, VP-47 deployed from Whidbey Island to Kodiak, AK, for six weeks of advanced base operations tended by *Currituck*. The squadron also operated from Cold Bay, AK.

On 2 August, VP-40, based at Sangley Point, lost P5M-2S BuNo 135478 and 12 crewmen. The lone survivor indicated that the aircraft had been struck by lightning, probably disabling the instruments. The pilot, CDR Norman P. Vegelahn, attempted to climb in order to give the crew a chance to bail out, but was unsuccessful. Also in August, VP-42 operated off Catalina from White's Cove.

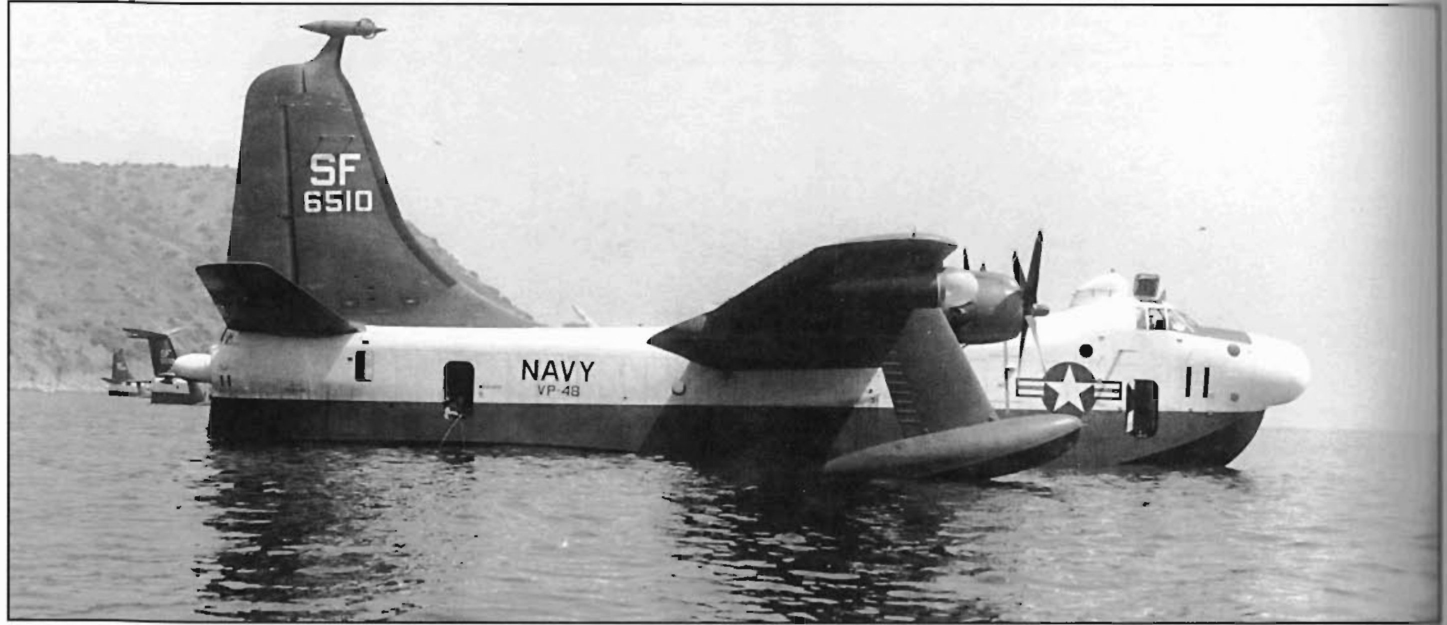


Above, VP-42 P5M-1 BuNo 127699 at White's Cove, Santa Catalina Island, on 27 August 1962. (William Swisher) Below, VP-48 P5M-1 BuNo 127698 at White's Cove on 31 July 1963. (William Swisher)



On 22 September, while on temporary assignment to NAS Kodiak, VP-42 lost P5M-2, BuNo 147937, and ten crewmen, and on 26 December, VP-42 lost SP-5A, BuNo 127712, and 13 crewmen when the aircraft disappeared on a night patrol out of San Diego.

1963: All in all, 1963 was a good year

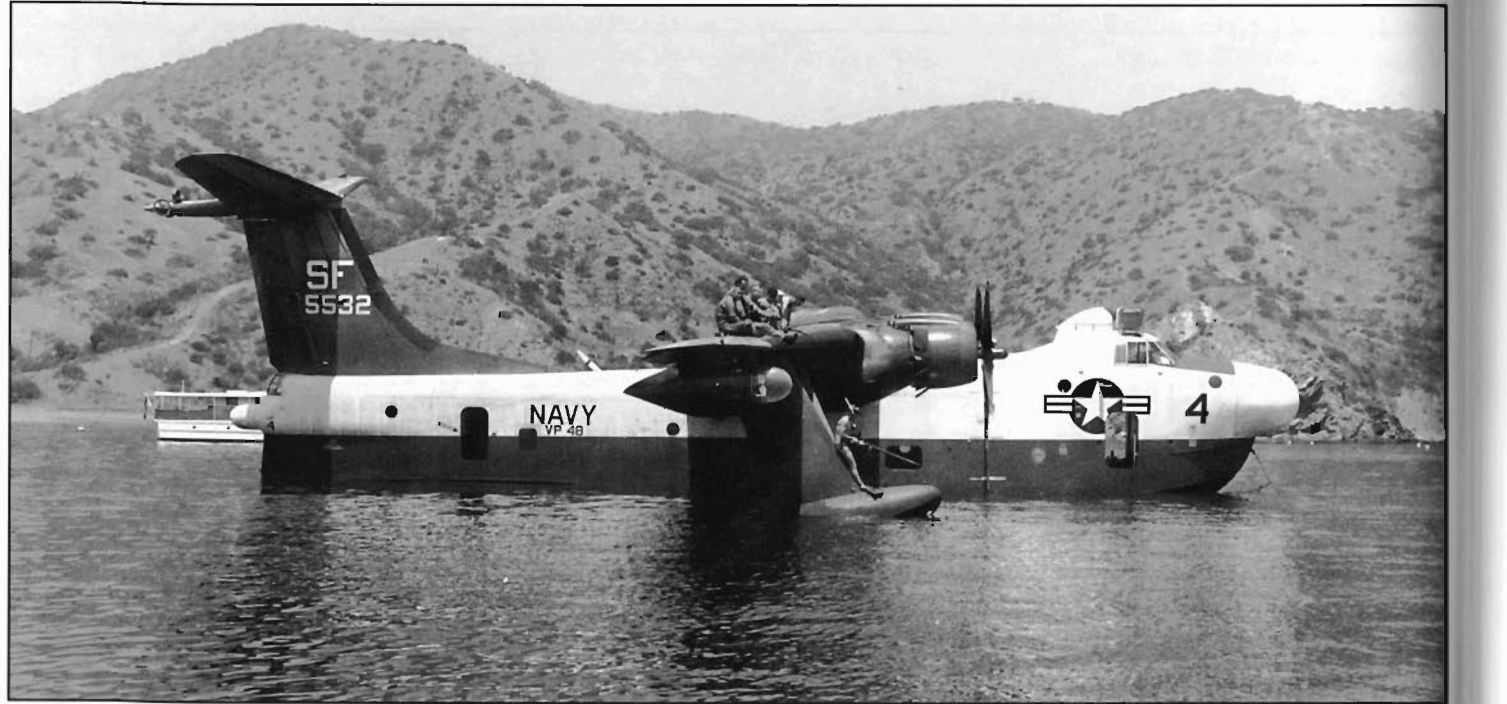


for the Marlin squadrons. No crashes or emergency landings are recorded. The overseas based squadrons, VP-40 at Sangley and VP-50 at Iwakuni, continued performing their assigned missions. CDR Thomas F. Begley recalls duty with VP-40: “My time at Sangley was filled with pilot training, area familiarization flights, OSAP's (Ocean Surveillance Air Patrols) over the South China Sea, a typhoon fly-away or two and occasional tender/seadrome operations at Subic Bay.”

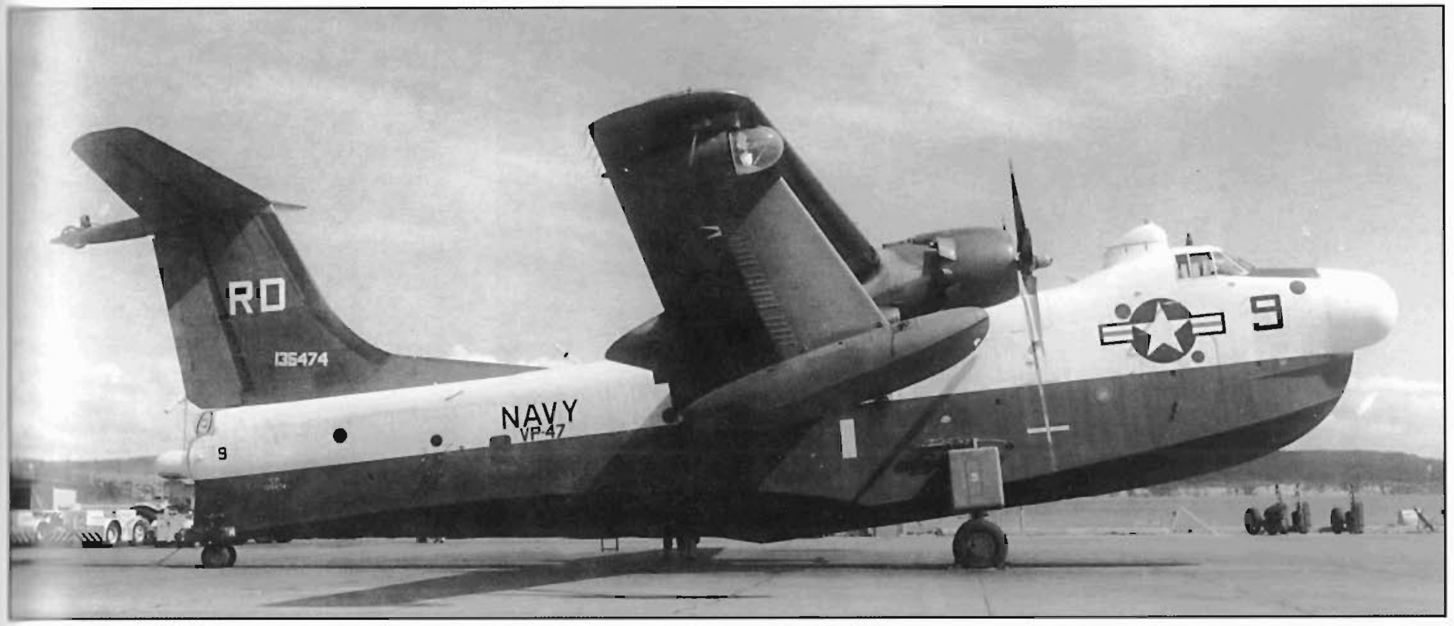
But the drawdown in seaplane assets continued. In April, VP-42 received its first SP-2E Neptune, replacing its last Marlin by August. With VP-42's conversion to landplanes, only four Pacific Fleet Marlin squadrons remained: VP-40, VP-47, VP-48 and VP-50.

In November, the overseas basing of patrol squadrons was eliminated by the Defense Department and VP-40's homeport was changed from Sangley Point to NAS North Island.

Above, VP-48 SP-5A BuNo 126510 moored off Catalina in White's Cove on 31 July 1963. (William Swisher) Bottom, five crewmen sitting on the wing of VP-48 SP-5B BuNo 135532 watching another fishing from the float while wearing snorkel gear on 31 July 1963. (William Swisher)



1964: In January, VP-48 operated from the Galapagos Islands, supporting scientific experiments and tended by *Pine Island.* In March, VP-48 deployed to Sangley Point, relieving VP-40. On 20 June, VP-47 again deployed to Cold Bay, AK, for ten days of tender operations, this time with *Salisbury Sound.* The ship later visited Astoria, OR, on 10 September for seaplane/tender operations with VP-40 for ten days.



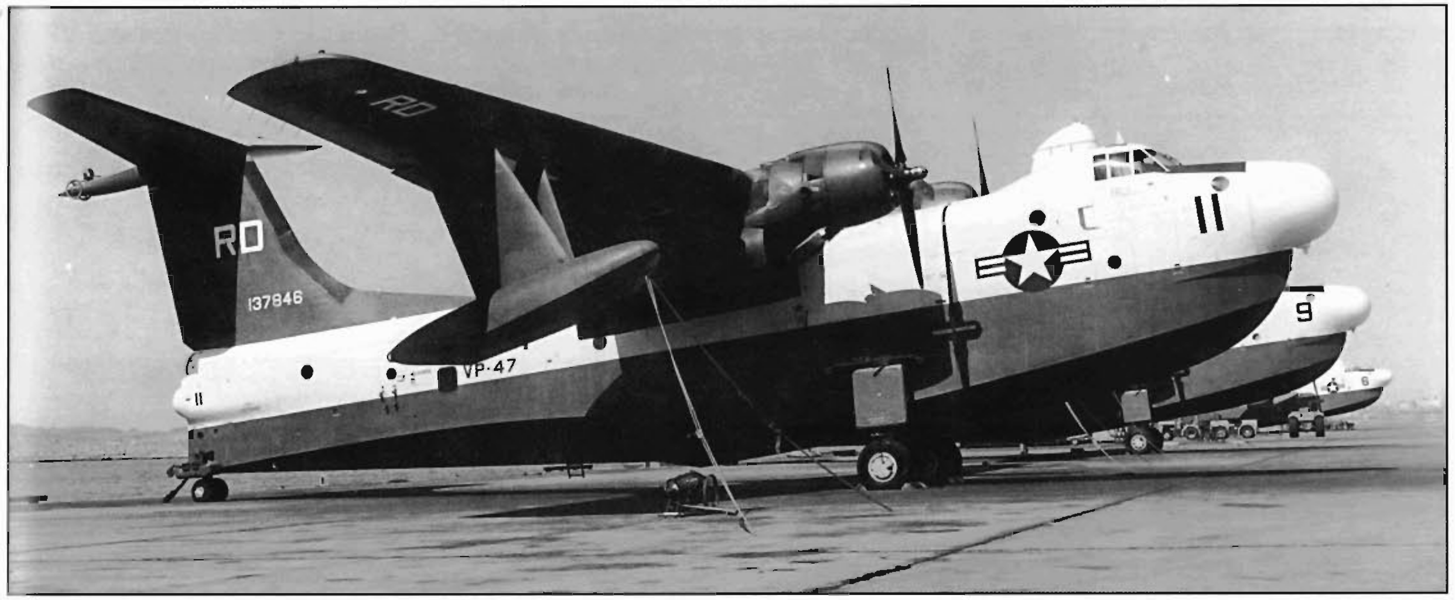
Above, VP-47 SP-5B BuNo 135474 at NAS Whidbey Island, WA, on 11 April 1963. (Doug Olson via Swisher) Below, VP-47 P5M-2 BuNo 137846 at NAS North Island, CA, on 20 August 1961. (William Swisher)

On 30 June, VP-50's homeport was changed from Iwakuni to North Island. With this change, Iwakuni was retired as a Marlin deployment site. All future Marlin deployments would be to Sangley Point.

In July, VP-50 was in the process of moving from Iwakuni to North Island but was leaving its aircraft behind for disposal. The squadron's personnel and other equipment were en route to the United States.

On 2 August 1964, an attack by North Vietnamese torpedo boats was believed to have taken place against the destroyers USS *Maddox* and *Turner Joy.* All available Pacific Fleet assets were directed to be used in support of the Seventh Fleet. The commanding officer of VP-48, which was deployed to Sangley Point, acted as Task Group Commander of Patrol Force SEVENTH Fleet and the Philippine Patrol Group (CTG 72.3), and was operational commander of all VP operations in the area. During these first few months of U.S. major involvement in the Vietnam War, VP-48 was initially augmented by detachments from VP-28 (SP-2H/P2V-7) and VP-42 (SP-2E/P2V-5). Crews were sent to Iwakuni to retrieve the aircraft left by VP-50.

VP-47, which had relieved VP-48 on 18 August, conducted operations in Okinawa, Japan, Korea, the Philippines and Vietnam. The squadron and *Salisbury Sound*, operating from Da Nang, provided ASW coverage for Seventh Fleet units operating off the Vietnamese coastline.

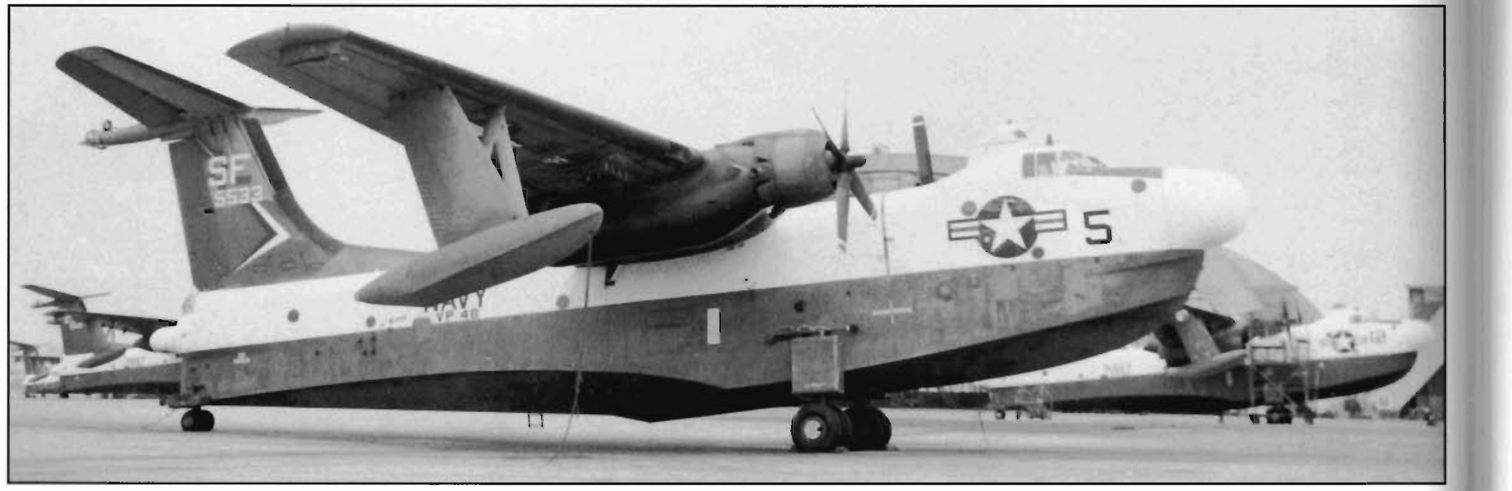


Above, VP-48 SP-5B BuNo 135493 over one of the California Channel Islands on 11 April 1965. (USN) Below, VP-48 SP-5B BuNo 135533 at North Island. (J. Esposito via NMNA)

Initial patrols were concentrated on surface and subsurface surveillance of the Gulf of Tonkin aircraft carrier operating areas (later termed Yankee Station and Dixie Station). Discovery and capture of a North Vietnamese trawler, loaded with arms for the Viet Cong enemy, led to the institution of one of the Navy's most extensive blockade operations. Market Time, as the operation was named, included numerous surface units, occasional carrier ASW aircraft and patrol aircraft based ashore at Sangley Point, P.I., U-Tapao, Thailand, Cam Ranh Bay and Da Nang, Vietnam. The tenders, *Currituck, Pine Island and Salisbury Sound,* provided support for advanced base operations of SP-5Bs at the Con Son Islands and in Camh Ranh Bay, South Vietnam. As in previous conflicts, the flying boat had the advantage of operating from a seaplane tender positioned in the forward area and wasted no time in transiting to patrol station. Not only were the Marlin squadrons tasked with watching for Communist shipping attempting to supply North Vietnam and Viet Cong in South Vietnam but also watching for any Chinese or Soviet submarine activity in the area.

These Market Time patrol Marlin were armed with underwing rockets, both 2.25 inch SCAR as well as five-inch HVARS. Since the tail turret had been removed from the P5s years previously, provisions were made for them to carry .50 cal. and/or M-60 machine guns in various hatches. Crew strength was increased by up to eleven men.

1965: In March 1965, VP-47 returned to the United States and was reassigned to NAS Moffett Field, CA, for transition to the P-3A Orion. The remaining Marlin squadrons, VP-40, VP-48 and VP-50, would continue to rotate the duty of close patrols of the Vietnamese coast. VP-40, which had relieved VP-47, operated detachments from *Salisbury Sound* at Ko Sumai, Thailand, and from *Currituck* at DaNang, South Vietnam. VP-50 relieved VP-40 in August and operated detachments from *Salisbury Sound* at Buckner Bay and from *Pine Island* at Cam Ranh Bay. Squadron history shows that VP-50 flew 162 Market Time missions and its aircraft were hit by ground fire on 10 occasions. From 1 October until September 1966, VP-48 deployed a six-aircraft detachment to Sangley Point, rotating one relief crew and associated ground personnel to the detachment on a monthly basis. During this deployment, the detachment conducted surveillance patrols over the South China Sea and Market Time operations over the coast of South Vietnam. VP-48 was supported by *Pine Island* and *Salisbury Sound* at Cam Ranh Bay and by *Currituck* at Buckner Bay.



PINE ISLAND

Above, VP-48 SP-5B aboard the USS Pine Island (AV-12) on 12 February 1963. (USN) Bottom, VP-48 SP-5B BuNo 135542 at White's Cove on 22 July 1965. (William Swisher)

1966: VP-50 deployed to Sangley Point on 23 August, and the six aircraft VP-48 had operated were transferred to VP-50. From August until February 1967, VP-50 maintained a Market Time detachment at Cam Ranh Bay aboard *Currituck.* On 15 November, VP-48 transitioned to the P-3 Orion.

VP-40's John Roderick was on anti-sub patrol off the coast of California when: "We were trained and warned to run the engines at climb power after every 30 minutes at economical cruise power so as to burn out the build-up in the plugs. We normally cruised at 1,500 ft on a patrol. Most of us followed these rules religiously, but sometimes to no avail. We were about 200 miles off the coast when we received a radio call for an "emergency fog recall" due to incoming weather. Anyone familiar with San Diego weather knows how fast fog can move in over the city. At 200 miles out with an airplane that cruises at 140 kts we knew we were in for an interesting night. We initiated our climb to 2,500 ft for our return to base and the left engine lost power as the throttle was advanced. This was not uncommon as some crews had had this happen in the past; shut down the engine, jettison all removable items, and return to base on one engine. I was and still am, a firm

SF
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NAVY
VP-48
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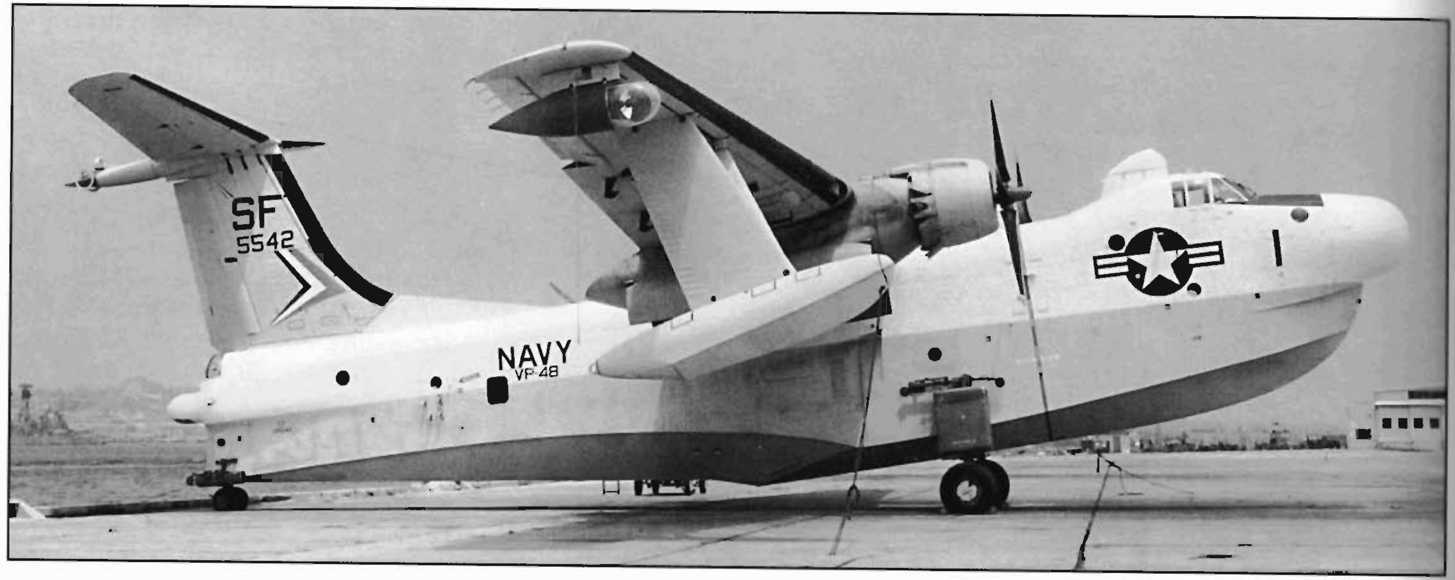
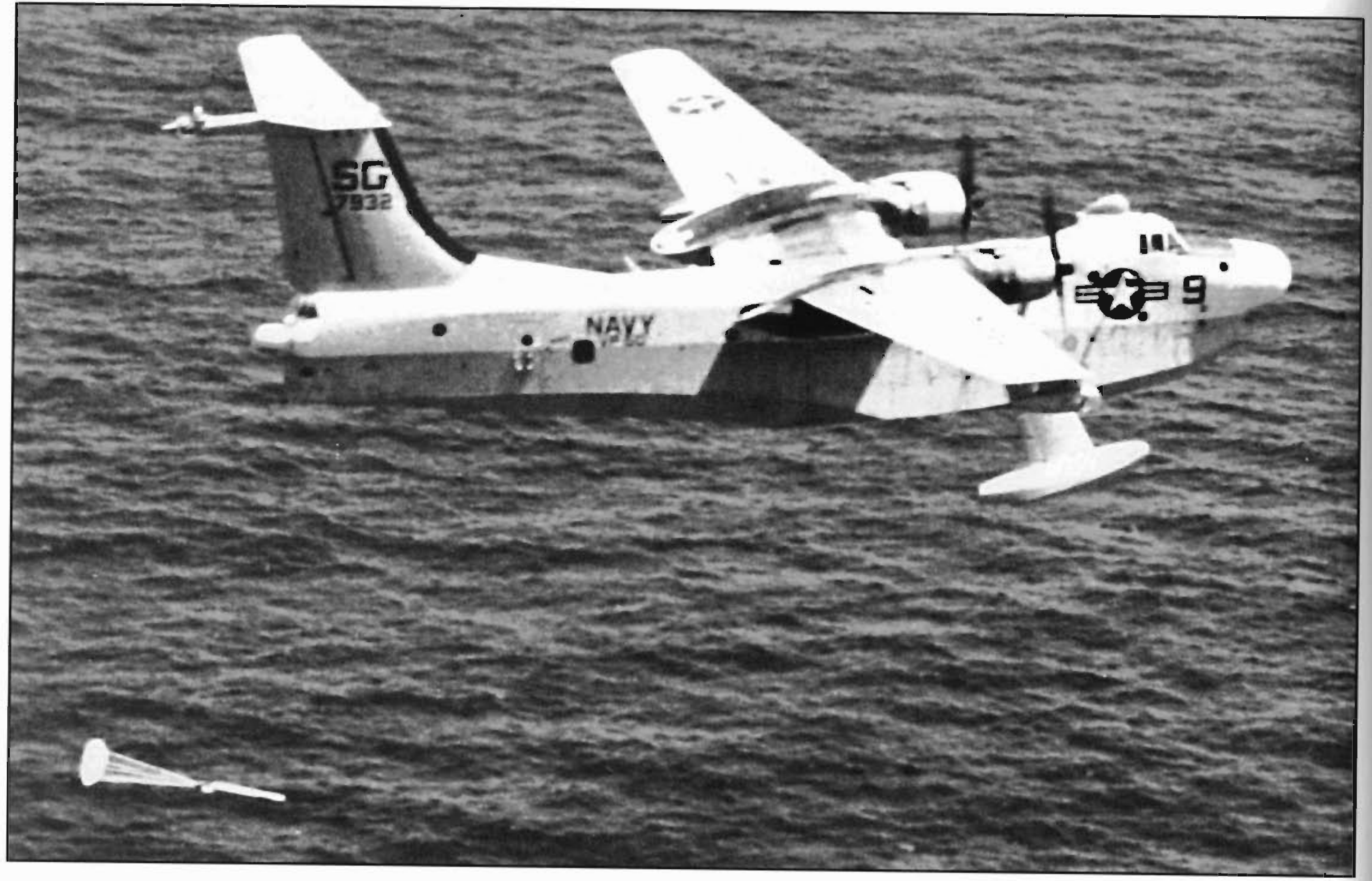
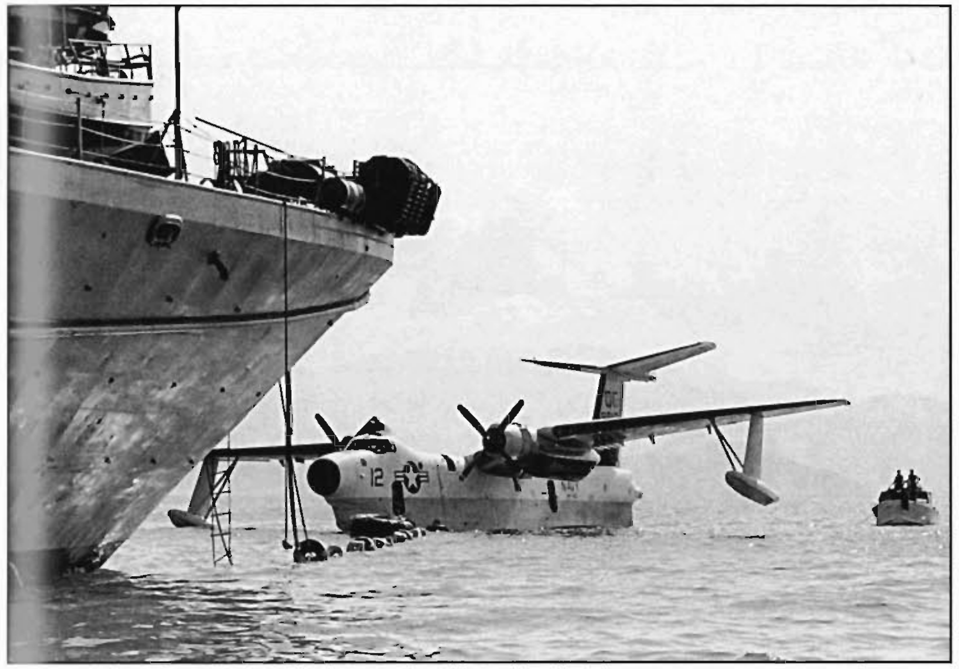


Above, VP-48 SP-5B BuNo 135542 at North Island on 12 June 1965. (Doug Olson via NMNA) Below, VP-50 SP-5B BuNo 147932 drops an aerial torpedo during a training exercise off North Island in 1965. (USN)

believer that, if partial power is still available on one engine of a two-engine airplane, then use that partial power to continue flight on two engines providing it is not burning or coming apart. I asked the plane captain (an AD-1) to check the "Chinese television" (engine analyzer) for the spark plugs. He stated that a number of plugs in that engine weren't firing. I adjusted the power to where the engine ran smoothly, and we continued on. About a half an hour later I noticed a jump in the BMEP of that engine, and upon checking found it was running normally. This was not unusual and had happened many times on the R-3350. Restoring cruise power to the balky engine, it operated fine the rest of the flight.

"We arrived over San Diego only to find it was zero-zero in fog. We were capable of flying a zero-zero approach to a water touchdown at the Navy's South Bay sealane (the only sealane in the world that had a GCA PAR approch), but another Marlin beat us to it, and after landing could not see to taxi, so anchored in the sealane for the night. Our alternate for San Diego was the Salton Sea. We climbed to 8,500 ft to get over the mountains and let down to less than 100 ft to land on this inland body of water. We spent the night on the airplane and the next morning, when the fog lifted, flew back to San Diego."





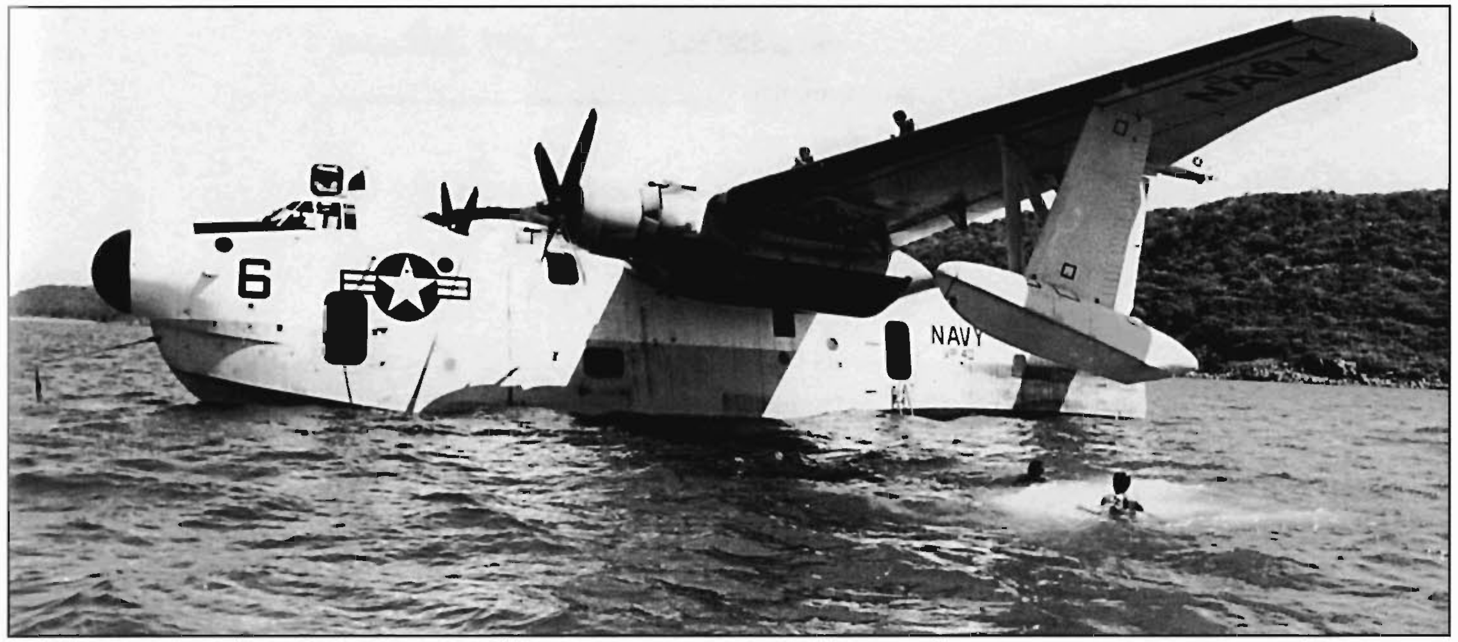
Above, VP-40 SP-5B moored aft of Currituck at Cam Ranh Bay, Vietnam, on 7 May 1967. (USN) Bottom, VP-40 SP-5B in Vietnam waters with crew swimming in August 1965. (USN)

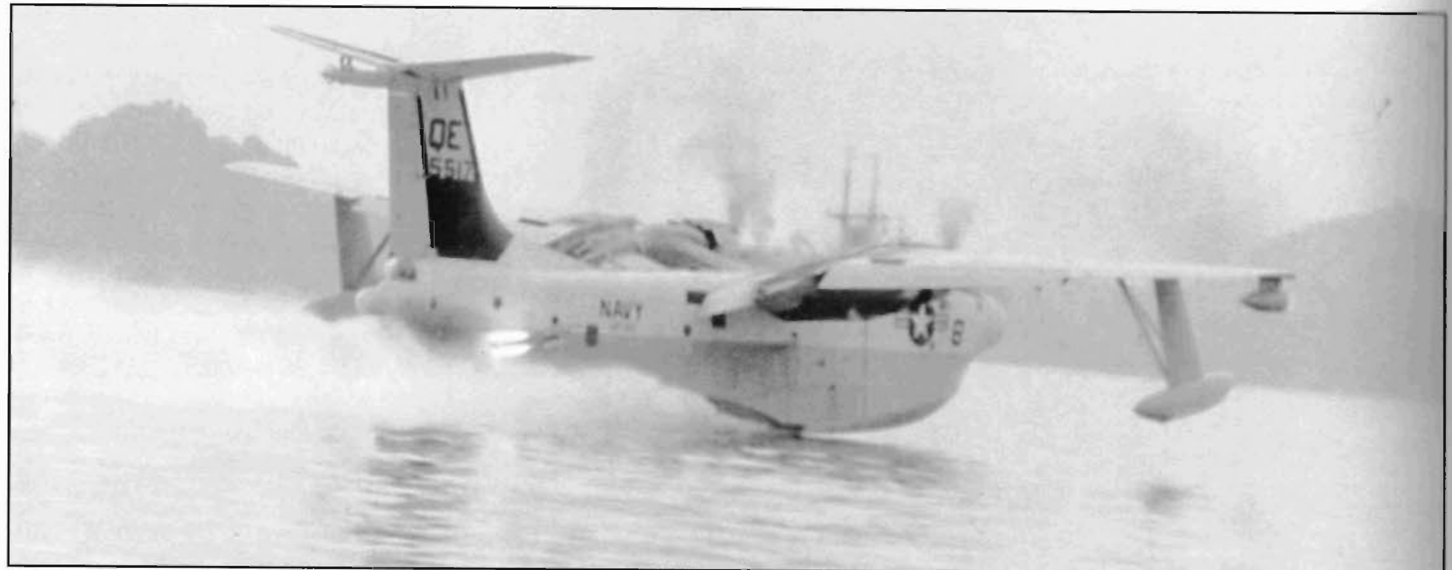
1967: The last Marlin casualty crash was suffered by VP-50 on 6 January. SP5-B BuNo 135525 crashed while on a training mission with loss of ten crewmen. The cause of the crash was never determined.

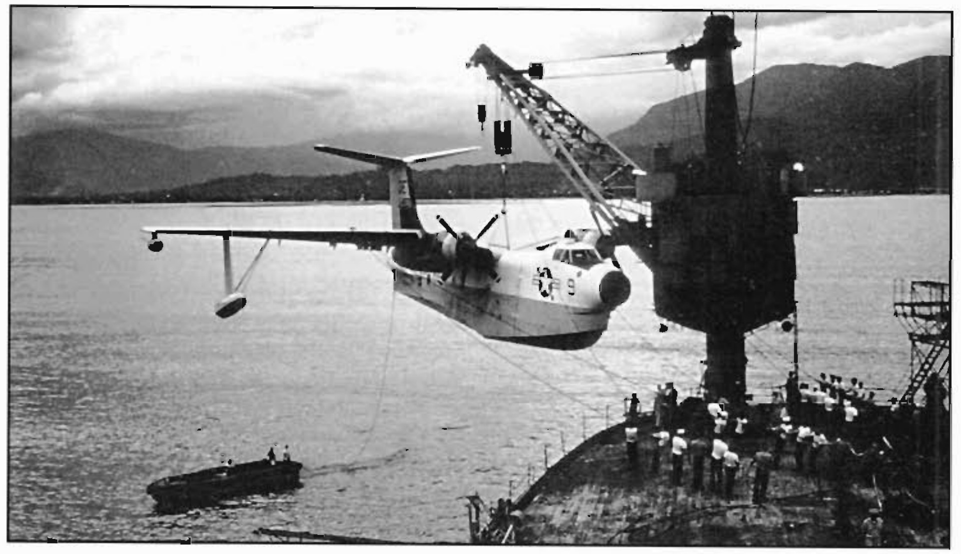
In February 1967, VP-40 returned to Sangley Point on what was to be the last deployment of a seaplane patrol squadron. Between 19 March and 12 April of that year, VP-40 and *Currituck (AV-7)* also participated in the last seaplane-tender operations conducted by the Navy, this at Cam Ranh Bay. During this period, an aircraft was maintained "on station," continuously, in support of operation MARKET TIME, accumulating a total of 860 flight hours. This was accomplished with seven SP-5B Marlin at the tender, with a maintained availability of 94.38 percent.

During this period, LCDR John Roderick recalls: "where on one operation the crews were awakened at 0300 and called to the briefing room. The AI told us a TOP SECRET message was received stating a Red Chinese sub was to surface off the coast of South Vietnam that night and run arms and ammo ashore for the VC. We were armed with four depth charges (500lbs each) and ten HVAR rockets (1,000lbs) and a full load of fuel. This put us about 2,000lbs overweight at the current temp/humidity. We used over 8,000ft of sealane to get airborne and then were restricted to an altitude of about 1,000ft for the next three hours until we burned off enough fuel to climb. Our patrols covered different sectors for about seven hours and never saw a sub. Not unusual for Vietnam operations."

The last operational combat patrol flight of a U.S. Navy seaplane was flown by VP-40's Commanding

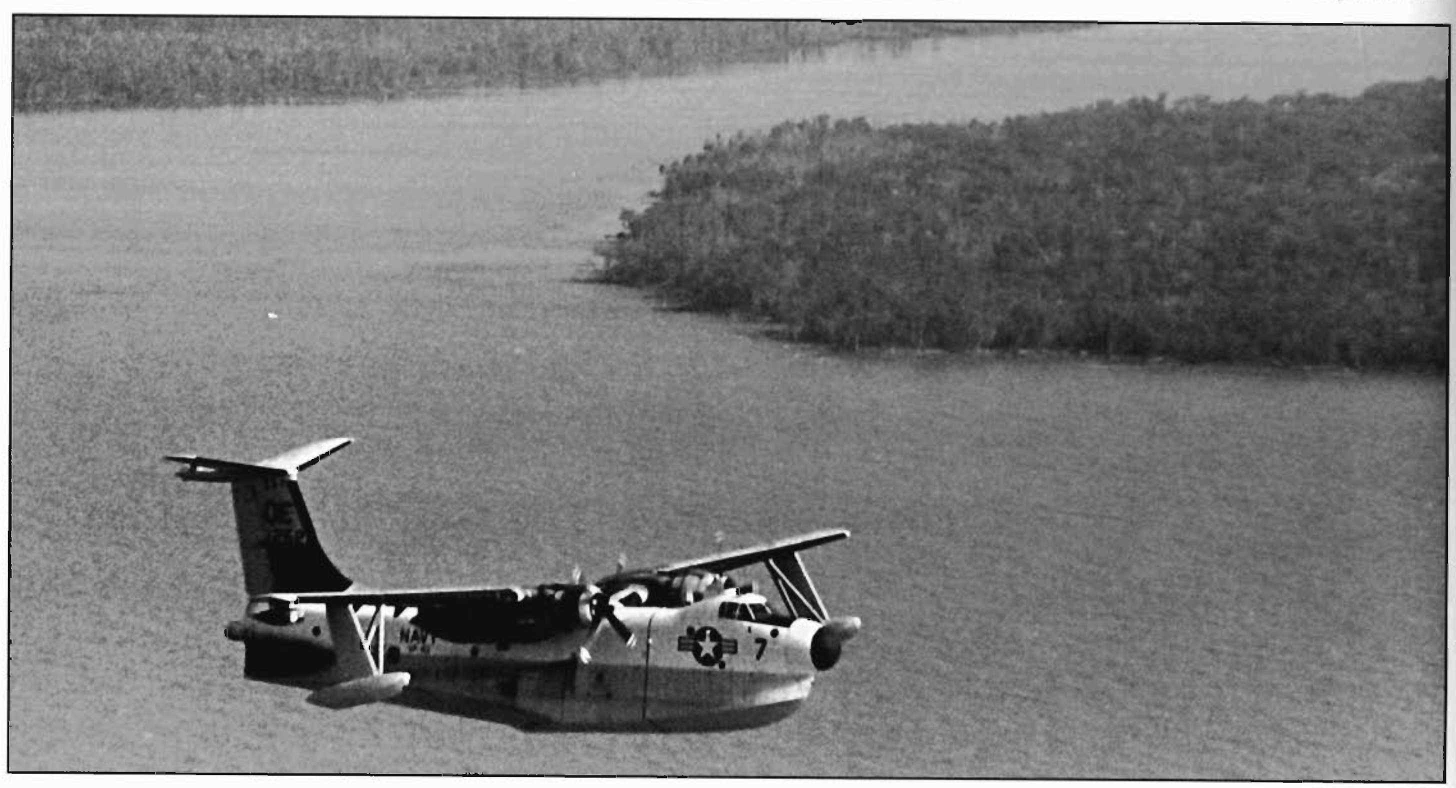


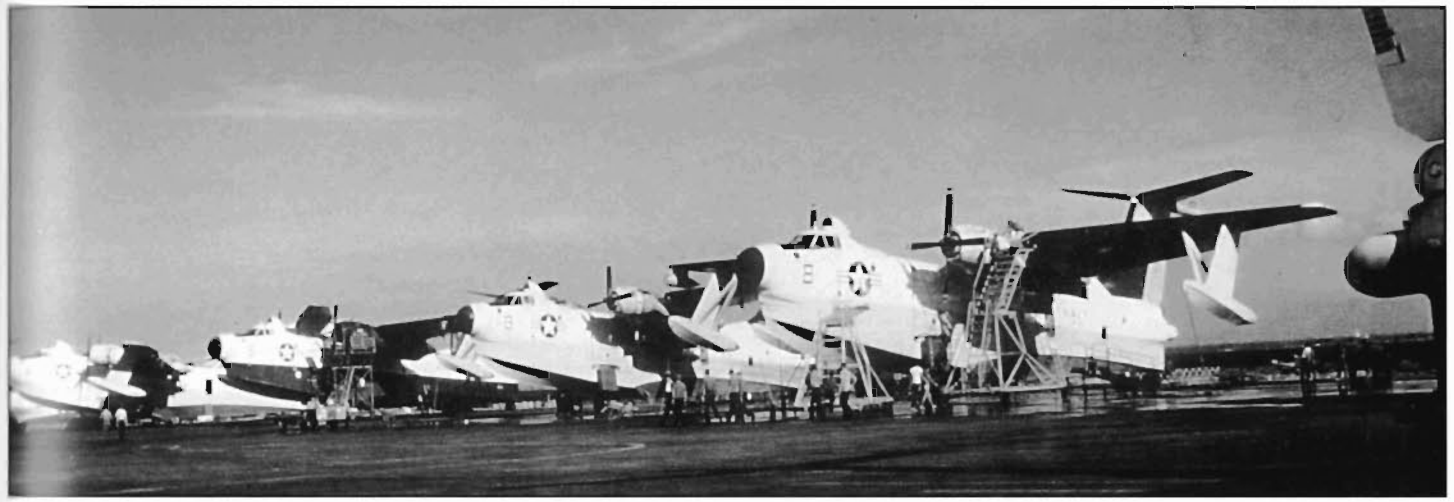




Above, VP-40 SP-5B BuNo 135517 during a JATO take-off from Cam Ranh Bay in April 1967. (USN via Robert F. Dorr) Left, VP-40 Marlin being hoisted aboard Currituck in Cam Ranh Bay during the 1967 deployment. (John Roderick) Below, VP-40 SP-5B BuNo 141252 on an Operation Market Time flight in Vietnam in August 1965. (USN)

Officer, CDR Hugh Longino and VADM John J. Hyland, Commander Seventh Fleet, from Cam Ranh Bay. The last tactical patrol was flown by VP-40 on 10 May 1967 from Sangley Point. By June, most of VP-40's Marlin had been flown to Japan to be scrapped.



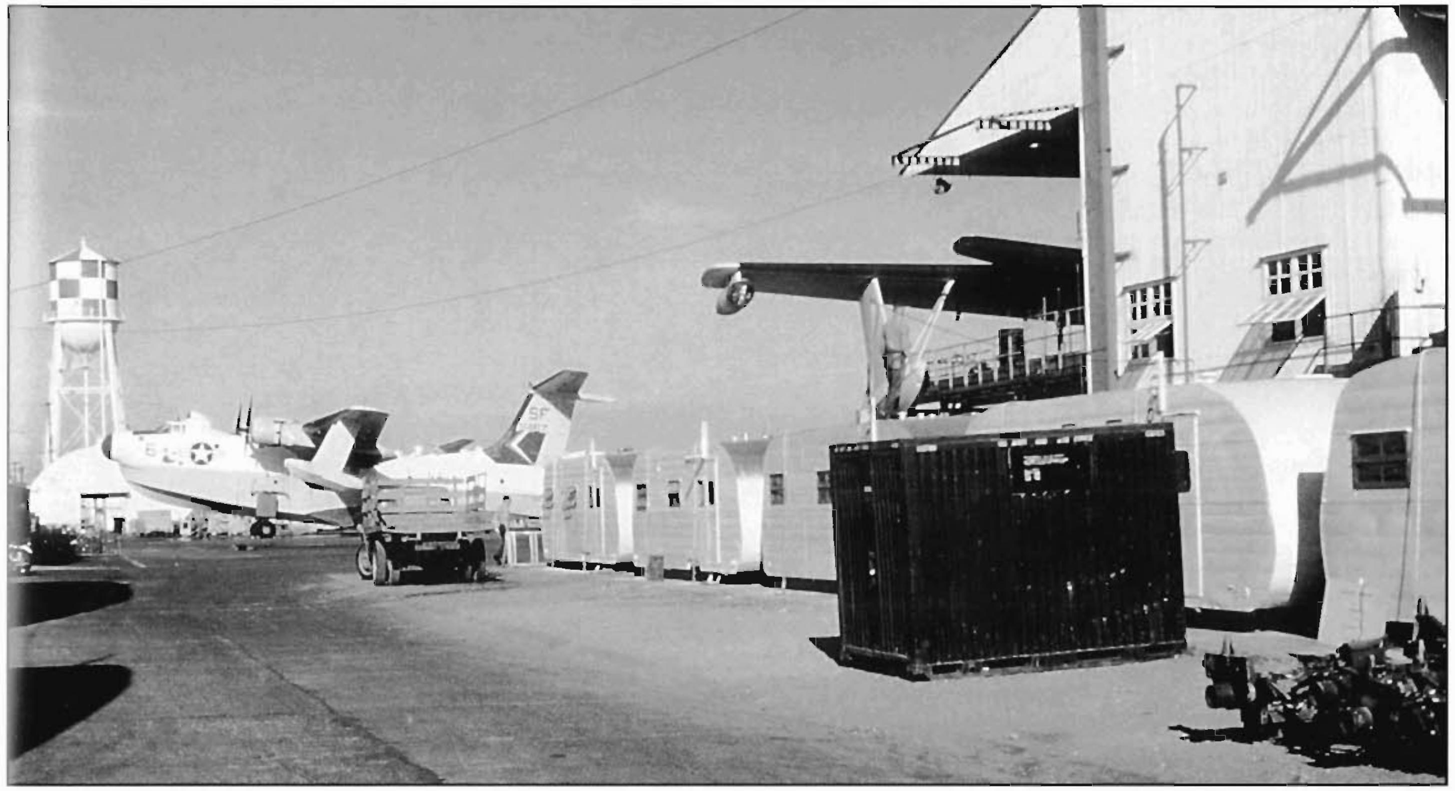


Above, VP-40 ramp at Sangley Point in 1967 was a mixture of grey and white and engine grey and white ships. (John Roderick) Bottom, VP-48 SP-5B BuNo 135487 at Sangley Point in 1967. Beaching gear was generally painted red. Area at base of fin was black with a red and white chevron on it. (John Roderick)

One Marlin survived and on 6 November 1967, VP-40's new Commanding Officer, CDR J. P. Smolinski, flew the final operational flight of a U.S. Navy seaplane in SP-5B, BuNo 135533, from NAS North Island. This flight was a "flypast" over the base to mark not only the last operational flight of a Martin flying boat but also the end of the Navy's 56 years of continuous seaplane operations.

BuNo 135533 made one more flight eight months later, on 8 July 1968, with a select crew, from San Diego to the Naval Air Test Center, Patuxent River, MD, where it was formally turned over to the Smithsonian Institution. In storage until 1976, this aircraft was then shipped to the National Museum of Naval Aviation, NAS Pensacola, FL, where it is on loan from the Smithsonian for permanent display.

END OF AN ERA
1911
1968
PATRON FORTY



THE JET POWERED MARLIN TESTBED

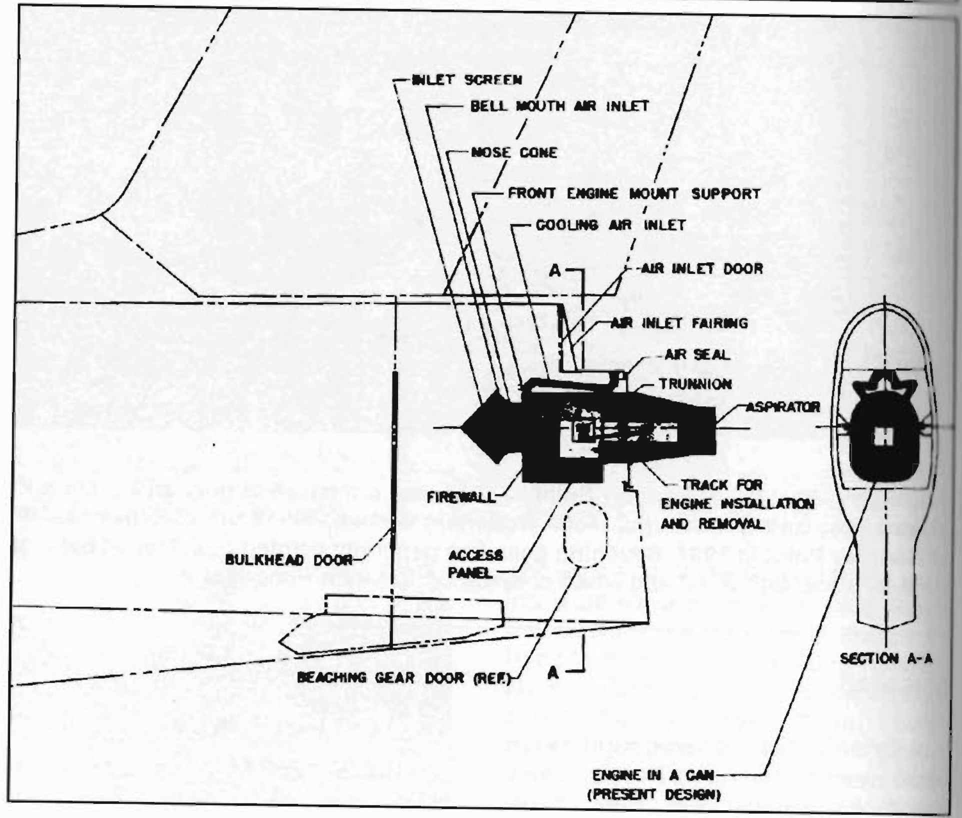
The P5M Marlin was a pleasure to fly. The hull design gave soft and stable landings and take-offs. In the air the Marlin was extremely stable, and with power-assisted controls it was very easy to maneuver. Water handling was superb because of reversing propellers and hydroflaps. However, the Marlin suffered one major weakness: it had poor single engine performance at heavy gross weight. This weakness had resulted in a number of lost aircraft and crews.

I finished the Naval Test Pilot School in early 1962 and began flying the Lockheed P-3 Orion at the Service Test Division (ST), Naval Air Test Center. A few coast-to-coast-to-coast non-stop flights in the P-3 showed me that I was helping to put the nail in the coffin of the patrol seaplane/tender system. The 400 knot P-3 had a 5,000 mile ferry range. It freed the patrol plane from the requirement to be based close to areas of interest and thereby reduced one of the strongest cases for the seaplane/tender system.

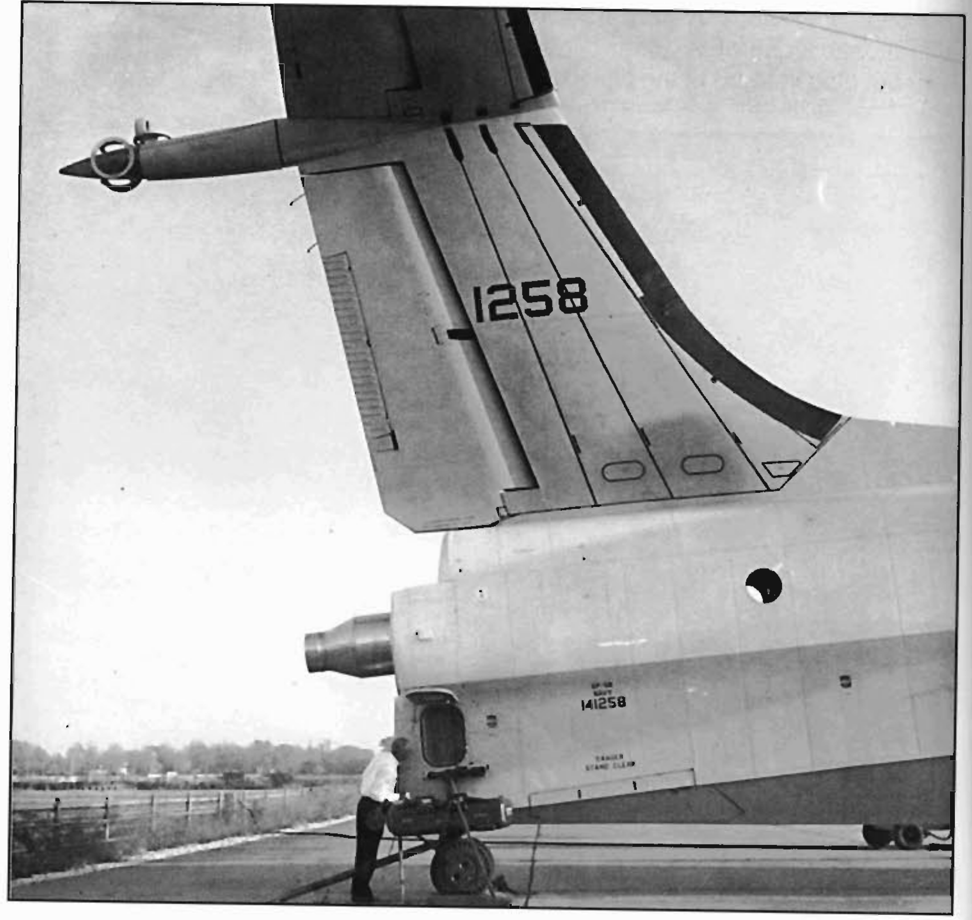
However, there are places in the world that even the P-3 couldn't cover and in early 1962 the P5M was scheduled to be in service for about ten more years. My Test Pilot School-acquired appreciation of the jet engine and some experience flying a P2V-5F Neptune with auxiliary jets got me thinking of some way to improve the single-engine performance of the Marlin. I contacted Fred Locke of the Bureau of Naval Weapons (BuWeps) and he sent me data on various P5 re-powering proposals that had been made through the years. These proposals ranged from the addition of two Westinghouse J34 jets on top of the wings to the replacement of the Wright R-3350 turbo-compound reciprocating engines with Rolls Royce "Tyne" or Allison T-56 turboprops. Fred told me that all of these schemes had been rejected on the basis of cost or degradation of mission radius. About this time Service Test received a North American T-39 Saberliner for some testing. After examining the T-39's Pratt and Whitney J60 jet engines, which developed 3000 lbs of thrust in a package 22 inches in diameter and weighing but 450 lbs, I began to conceive a somewhat different P5M auxiliary power concept. This concept involved placing a single J60 or General Electric J85 jet engine in the tail. A slide rule analysis revealed that one of these engines in the P5 would markedly reduce take-off time, allow safe operation on one reciprocating engine and would actually improve single-engine mission radius. A single jet in the tail turret position would not present asymmetric thrust problems and did not appear to introduce any undesirable pitching problems. I discussed the idea with fellow P5 pilots and came up with only two possible operational negatives: degradation of the performance of the Magnetic Anomaly Detector (MAD) equipment and added weight. I was able to dismiss the first since fortuitously my first project at Air Development Squadron One (VX-1) had been to evaluate the effect on MAD performance caused by the removal of the 20mm tail turret. Since we found no degradation caused by the turret removal, I was able to argue that the installation of a jet engine with magnetic influence similar to that of the original 20mm turret would have very little effect on the MAD. The weight question was even easier to dismiss. The P5M had been designed around a very heavy APS-44 periscope detection radar in the nose. When the APS-44 was replaced by the much lighter APS-80 and the 20mm turret was eliminated, it was necessary to add lead ballast in the tail to maintain proper balance. With a tail jet installation, the ballast could be removed and the overall increase in aircraft weight was near zero. On balance, a P5 auxiliary tail jet seemed to offer a lot of positives and no negatives.

The Patuxent River General Electric representative provided installation and performance data on the J85 and the Pratt and Whitney rep had not only provided similar J60 engine data, he found six brand-new surplus engines! These engines were from a canceled Army drone project and although not "aircraft qualified" (they were "50 hour" engines), they would provide an inexpensive proof-of-concept approach for my idea. Both the J60 and the J85 would run nicely on aviation gasoline and therefore did not require any separate aircraft fuel provisions.

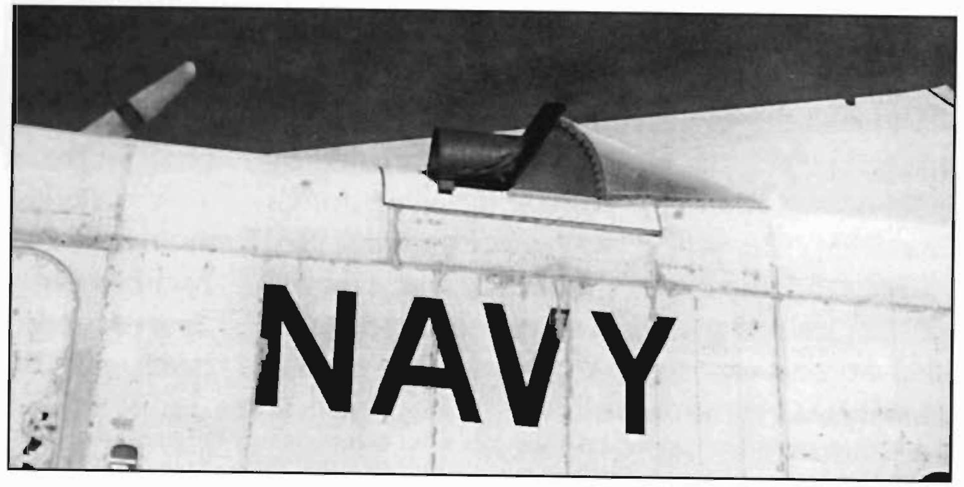
Since I knew that cost would be a major factor in the acceptance of this idea, I strove for the simplest and least expensive installation possible. A "free" J60 auxiliary jet would be installed in the original 20mm tail turret position, which was now occupied by the doppler navigation radar. (the doppler was to be moved forward and its antenna integrated into the nose radome). No special jet intake would be required: the jet intake was to be the former tail gunner's window opening. Naturally this faced aft, but since optimum efficiency was not a driving objective of this installation, the jet intake air could be sucked rather than rammed with no great loss of power. The former tail gunner's compartment, separated from the rest of the hull interior by a bulkhead and door,

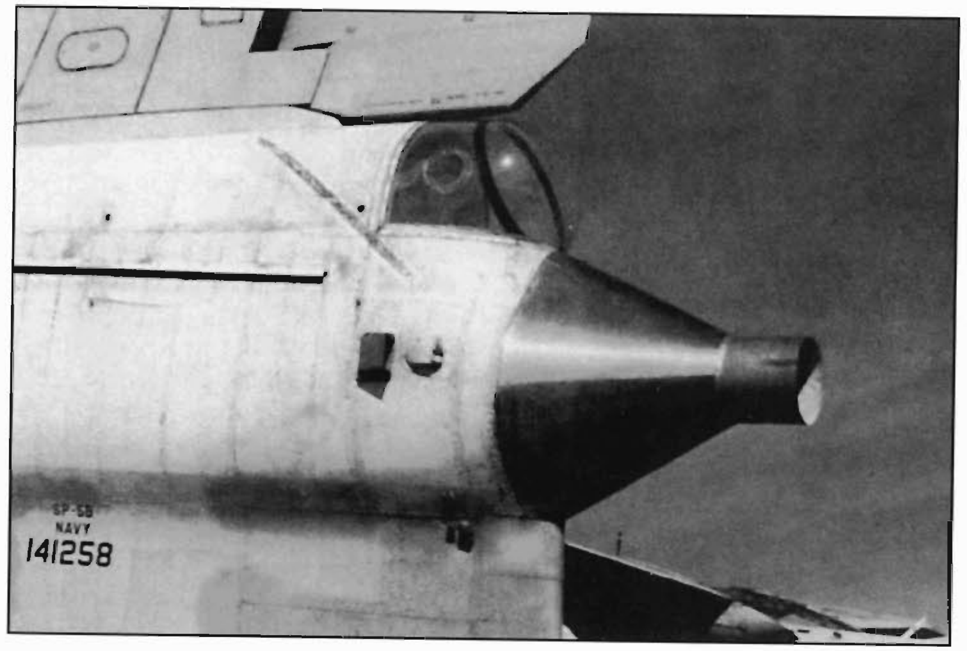


Above, proof-of-concept drawing for J60-P-2 jet engine installation in an SP-5B. (USN) Below, actual J60 installed in SP-5B BuNo 141258 at Martin in 1964. (Martin)



Above, BuNo 141258 with J60 installed with divers removing beaching gear prior to a test flight. Note NATC Flight Test insignia on tail. Wording on the fuselage aft of the hatch reads Flight Test Naval Air Test Center. (USN) Below, 141258 was transferred to San Diego for the J85 installation and testing. (USN)





Above, water separator was added to BuNo 141258 when the J85 was installed as seen in 1966. (Clay Jansson) Below, revised exhaust cone on the J85 installation on BuNo 141258. (Clay Jansson)

was to be a plenum chamber.

On 14 January 1963, I submitted a personal official letter to the Bureau of Naval Weapons describing the suggested installation, proposing a prototype be built using one of the "free" J60 engines and going into some detail as to its operational desirability, which centered about reduced take-off time (greatly reducing the strain on the reciprocating engines) and improved single-reciprocating engine performance with no loss in range or endurance.

BuWeps performed its own engineering analysis which showed the jet would improve the aircraft's rate-of-climb at 80,000lbs gross weight with one of the reciprocating engines out from zero to 405 feet-per-minute. Furthermore, normal take-off time was reduced by 22 seconds (34%) and take-off distance by 2,420 feet (42%). A contract for a single test installation was let to the Martin Company in Baltimore. As I recall, the contract was for $147,000, a sum which when compared to the cost of almost any other aircraft job, gives a good idea as to the simplicity of the basic concept.

I had been detached from the Naval Air Test Center and had joined the P-3 equipped Patrol Squadron 8 (VP-8) when the Martin Company completed the jet-assisted P-5 (BuNo 141258) proof-of-concept demonstration model on 2 December 1964. CDR George East delivered it to the Test Center. As much as I would have liked to participate in the testing, I was just too busy as XO of a fleet squadron. However, George flew most of the test flights and kept me informed as to progress. Initial results were quite promising, showing great improvement in take-off and single engine performance and no degradation of the MAD or doppler radar performance. George recalls that with one reciprocating engine feathered and the operating engine at 15 inches manifold pressure, (simulating a no-thrust or feathered condition) the rate-of-descent was only about 200 fpm. George was so impressed that he planned a demonstration flight over the Chesapeake powered only by the jet. A P-5 actually flying with both engines feathered would have made quite a photo! Unfortunately, BuWeps got wind of his plans and forbade the demonstration.

Maintenance problems inherent in supporting a single aircraft far removed from any major support base slowed the pace of the trials. Primarily because of maintenance problems, George's logbook shows only ten flights during 1965, four in January, one in March, one in May, two in June, one in August and one in September. On 9 June 1965, George called to tell me he had arranged for me to fly the jet P5. Everything worked right that day: the flight was a particular thrill for me and turned out to be my last flight in a U.S. Navy flying boat. The jet started easily, greatly reduced the take-off time and distance and the P5 was able to fly easily on one reciprocating engine. I felt rather smug in having solved one of the main drawbacks of the Marlin. Unfortunately, the test program didn't always run quite as smoothly as that flight. In addition to the aircraft maintenance problems, the J60 experienced sporadic compressor stalling during takeoff. Thinking the stalling might be engine-related, NAVAIR decided to replace the "free" J60 with a J85. To take advantage of the P-5 support available at VP-31 and the engineering capabilities of the Naval Air Rework Facility (NARF), the project was transferred to the NARF in San Diego where my former Postgraduate School classmate, CDR Gene Wisenbaker, was the Executive Officer. Gene was a former plane commander and maintenance officer in VP-40, a P-5 squadron based at Sangley Point. Bob Palk, a former Convair engineer with knowledge of the Sea Dart jet seaplane fighter program, was then the NARF Engineering Department Superintendent. Bob named civilian engineer George Hemingway as the Project Engineer.

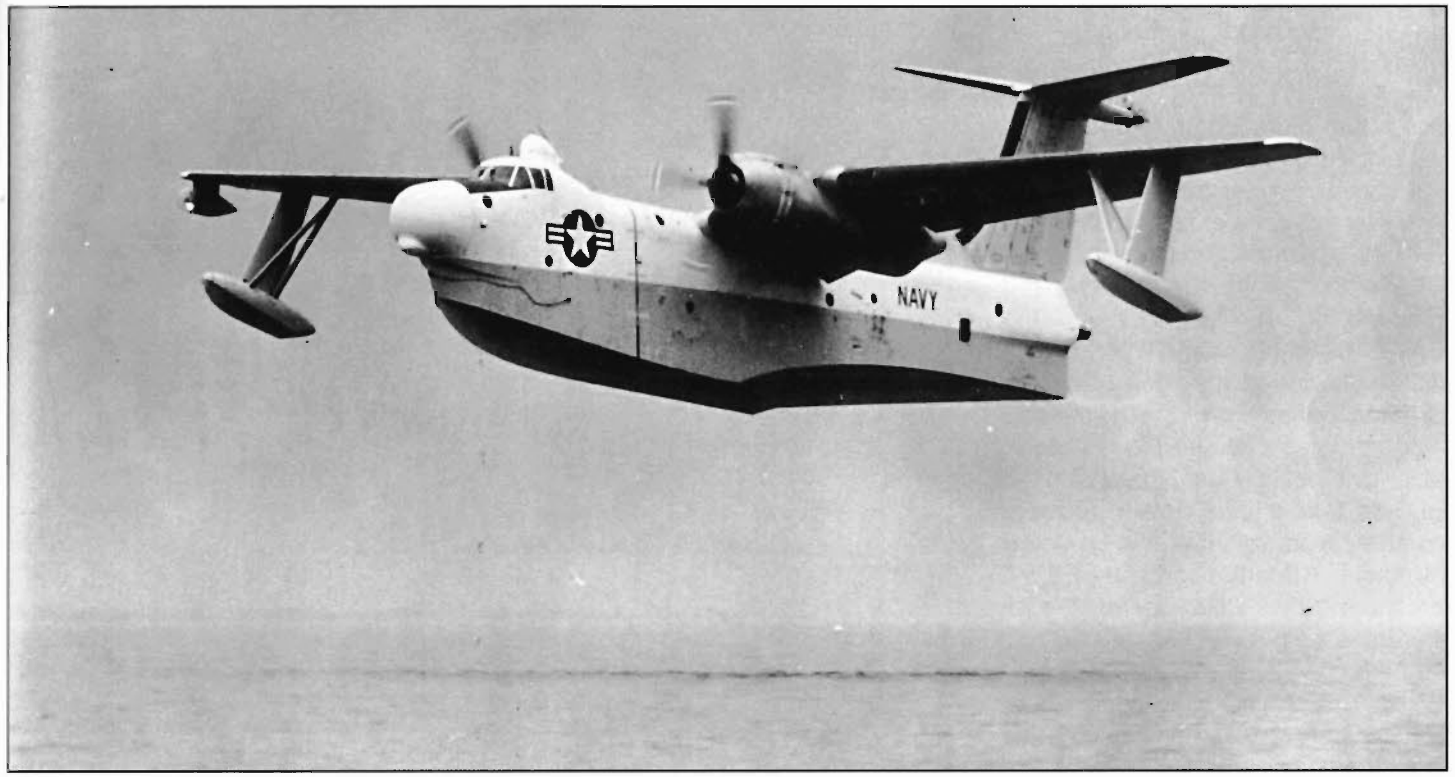
Installation of the new J85 engine went smoothly. Enthusiasm for the project by NARF personnel was high, as it was rare for a facility with a basic mission to overhaul and repair aircraft, engines and components to be able to do the modification and testing of something new.

Design, installation and ground test of the J85 took some months to complete and then flight test was carried out by the NARF Flight Test Division. Gene acted as plane commander, the rest of the crew was made up of NARF personnel with previous P-5 experience in VP-31, FAETUPAC and the NARF test line. Gene said the first two take-offs were a P-5 pilot's dream. The aircraft literally leaped onto the step and into the air. It was like having permanent JATO. Even with one reciprocating engine feathered there was power to spare. There was a smug feeling of superiority in having an engine feathered and being able to pass and pull away from an unmodified Marlin, and a great deal of comfort in knowing that an engine failure at heavy gross weight was not life-threatening.

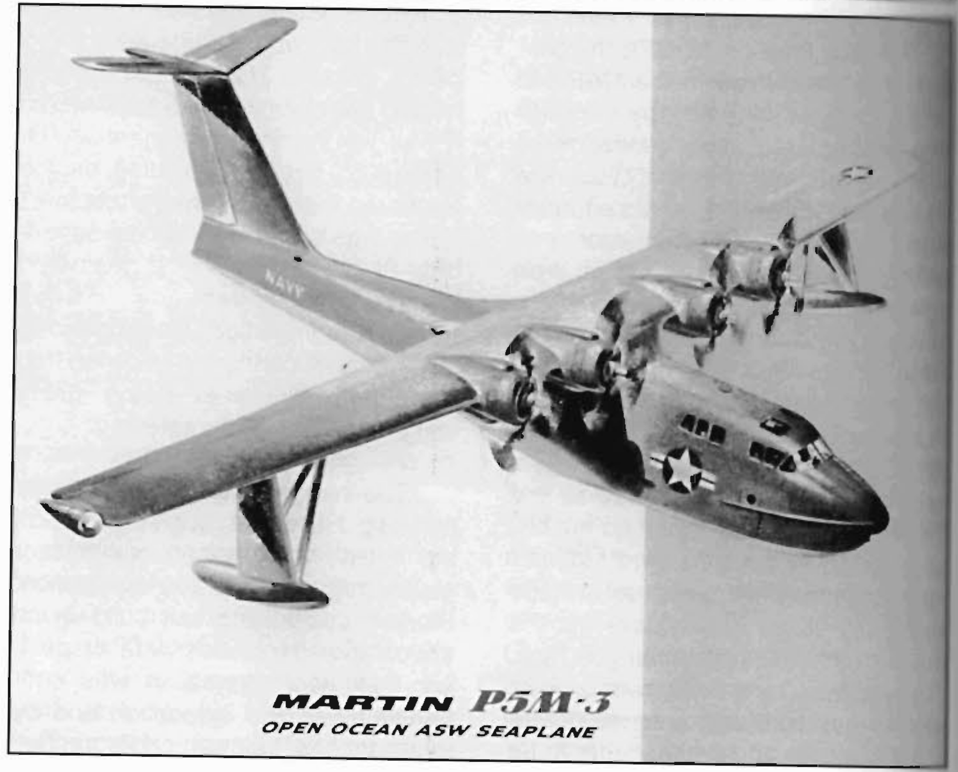
The third test flight brought a rude awaking. Halfway through the take-off the engine experienced compressor stall, a replay of the J60 experience. Plenum design and salt build-up on the compressor blades were suspected. Salt water ingestion was confirmed by engine inspection and by movies of a take-off photographed from a helicopter trailing above and behind the P-5. Spray churned up by the reciprocating engines seemed to materialize into a cloud just aft of the tail which was then sucked into the aft-facing jet inlet. Some additional time was needed to design a water separator which consisted of many three-foot lengths of tubing cut in half longitudinally and straggered in three rows across the intake. The water separator and a cockpit-controlled fresh water wash system solved the problem. Fresh water wash after every take-off became routine. About five more flights were made which confirmed the aircraft performance improvement given by the jet pod and identified areas of improvement needed for a production installation. The last test flight was made on 16 August 1966.

In summation, the tests of the proof-of-concept installation of the jet pod were successful, but a fleet-use-ful jet pod required engineering refinement before being released for service use. The subject became moot when the Navy made the decision to completely phase out the flying boat by the end of 1967. The test aircraft was placed in storage and no further jet pod installations were made.

Below, BuNo 141258 with J85 installed in the tail shortly after take-off while operating out of San Diego. (USN)



MARLIN'S PROPOSED SUCCESSOR, THE OPEN OCEAN SEAPLANE



Because of post-war advances in aerodynamics and hydrodynamics, a practical open-ocean flying boat appeared feasible. In 1955, CNO Operational Requirement Number AS-040502 required all future Anti-submarine Warfare (ASW) seaplanes to land, take-off and maneuver in the open sea. Open sea operations were desired in sea conditions up to Sea State 5: a "rough sea" with waves of up to 12 feet.

Basic physics told that since impact force is a function of the square of the impact velocity, a practical open ocean seaplane would have to have a very low landing speed. Halving the landing speed reduces the impact force by a factor of 4. The desired landing speed of the Open Ocean Seaplane was to be 35 knots.

The Navy issued a Request for Proposal (RFP) for the Open Ocean Seaplane on 21 May 1956. Three companies responded: Grumman, Martin and Convair.

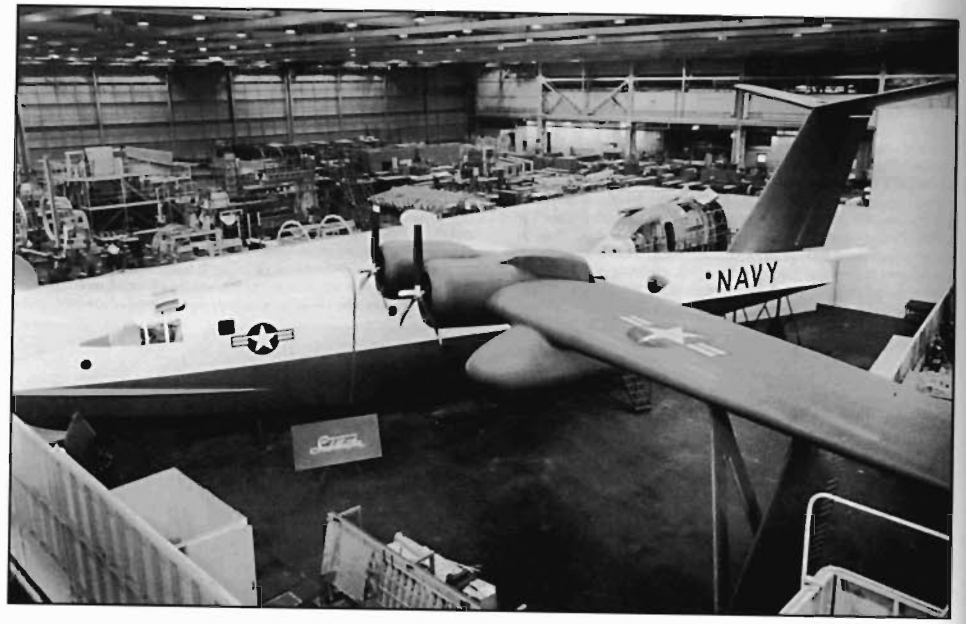
The Martin Model 313/P5M-3/P7M "Submaster"

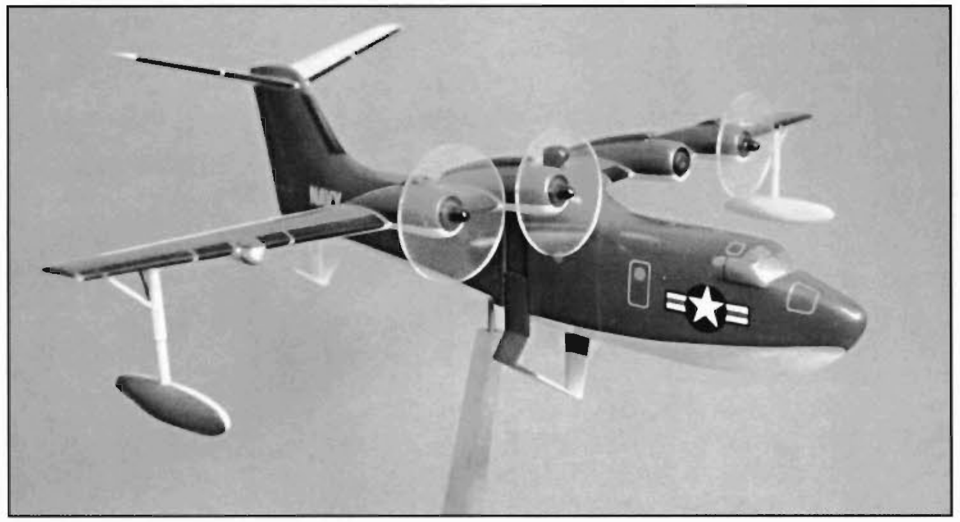
Martin's entry had started in 1955 as an unsolicited follow-on to the Marlin. Known within the company as the Model 313 or P5M-3, the design used the high length-to-beam hull developed for the jet P6M SeaMaster, but had a conventional straight wing and was to be powered by four Wright R-1820-82 piston engines of 1525 HP. To achieve the low landing speed required for open sea operation, the P5M-3 used boundary layer control (BLC) blowing of the wing using the exhaust gases from a single fuselage-mounted General Electric XJ85 jet engine of 2400 lbs. thrust. With the BLC on, take-off and landing speed at combat gross weight was to be under 50 knots. A Martin Company P5M-3 brochure shows a stall speed at landing gross weight of 41 knots.

In 1956 a full-scale mockup was built for the Navy competition and the final design became known at Martin as the P7M SubMaster. The P7M differed from the P5M-3 by the addition of weapons bays under the wings outboard of the R-1820s and by having two J85s, which were mounted on top of the wing in the outboard nacelles. The second J85 was probably added to the design to meet a requirement for engine-out take-off. The functional description of the jets was changed from "providing BLC air" to "auxiliary thrust and BLC units".

Above, artist's concept of the Martin P5M-3. (Martin) Below, mock-up of the Martin P7M SubMaster. (Martin)

The P7M's Normal Gross Weight of 78,240 lbs. was similar to that of the P5M-2's 76,635 lbs. Performance figures except for the lower landing speed of the P7M were quite similar as well. The P7M design was not selected by the Navy.





Grumman's Design 132

Grumman's entry, submitted on 10 August 1956, was Grumman Design 132, quite similar in external appearance but considerably larger than the P7M. Design 132 was to have a take-off weight of 110,712 lbs and was to be powered by four Pratt and Whitney R-2800-49 piston engines of 2300 HP. Wing area was to be 1700 sq. ft.. Although reference is made to a BLC system in the Grumman letter submitting the design to the Navy, no BLC system is evident in available Grumman engineering documentation. The Grumman letter states that "the remarkably low hull landing and take-off speeds of which this aircraft is capable are achieved by the use of hydrofoils."

The Design 132 proposed using a "Carl Configuration" hydrofoil set. This configuration used a large, retractable main hydrofoil located on the hull under the wing and a small retracting balancing hydrofoil located near the tail. On take-off, the hydrofoil lifted the hull out of the water at 30 knots. On landing, the hydrofoil supported the aircraft above the water until the aircraft slowed to 30 knots.

Grumman's proposal included a specially designed sonar system, to be furnished by the Bendix Pacific Division and a Loral integrated data system. On 1 February 1957, Grumman was informed by the Navy that Design 132 was not selected.

The Convair P6Y

Convair's winning proposal was a unique tri-motored parasol wing design with a Design Gross Weight of 107,640 lbs. and a wing area of 2500 sq.ft. It used three Wright R-3350-32W engines of 3,700 hp each and had two YJ85 jets in the rear of the center nacelle. The jet engines provided BLC air for take-off and landing and could be used for thrust augmentation in flight to attain increased dash speed, rate-of-climb and improved engine-out performance.

In BLC mode, the BLC air blew over the flaps and ailerons and the BLC wing ducting included swiveling nozzles at the wingtips. These nozzles were designed to improve lateral controllability at low airspeed. BLC was not used on the tail surfaces: an advantage of the tri-motor configuration was that the slipstream of the center engine provided enough airflow over the tail surfaces for good longitudinal and directional control at low airspeeds. The power-on stall speed of the P6Y at a landing weight of 75,525 lbs. was estimated to be 40.4 knots.

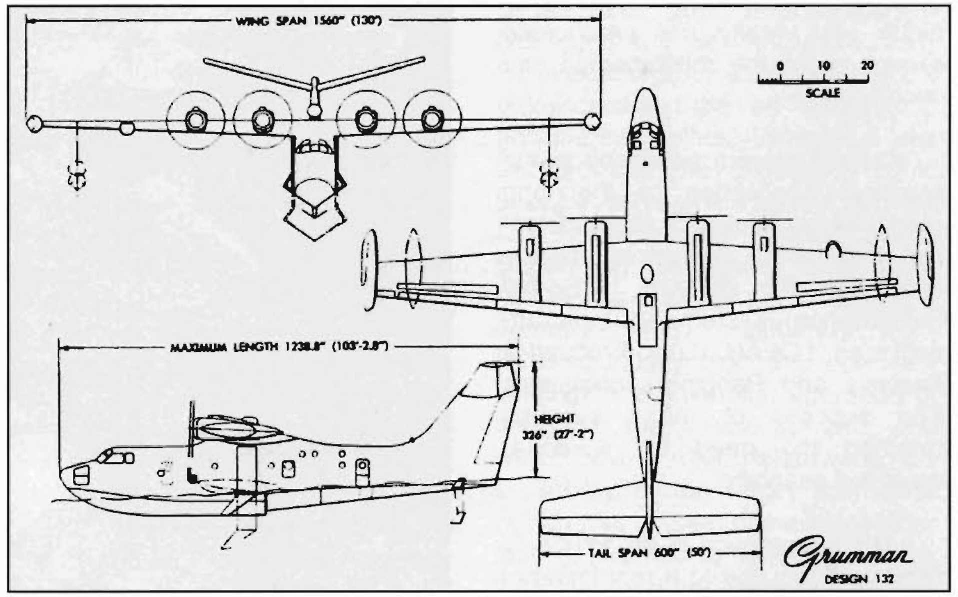
The Navy selected the P6Y as its Open Ocean Seaplane and a contract was signed in February 1957 for two XP6Y-1 prototypes, which were assigned the BuNos 147206 and 147207. However by the summer of 1957 the funding was frozen and the P6Y project came to a halt.

Above, model of Grumman Design 132 with hydrofoils and wing tip floats extended. (Northrup Grumman History Center) Below, Design 132 proposal 3-view drawing. (Northrup Grumman History Center)

Why the P6Y was Cancelled

Although no specific document giving the reason for the end of the P6Y program has been found, in the light of Navy procurement activities in the mid-1950s some reasonable conclusions can be drawn.

During this era the Navy had become committed to the extremely expensive Polaris missile program, not only to the development of the missile, but also to the development



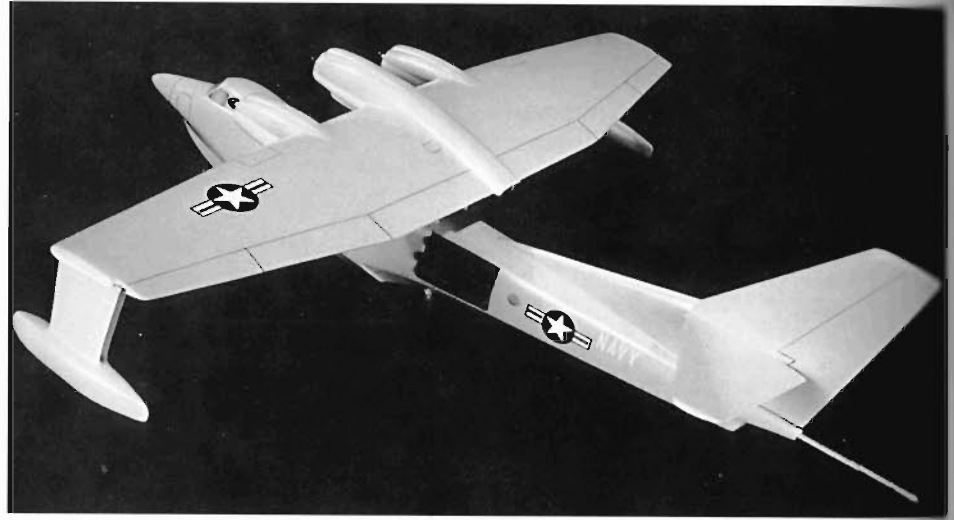
of the Polaris-carrying nuclear submarine. The F4H Phantom interceptor and the A3J Vigilante nuclear-capable jet bomber entered development as did the nuclear-powered attack aircraft carrier. The P6M jet-powered Seamaster was another expensive program which would not be canceled until 1959.

In patrol aviation, the P3V Orion was proposed in 1957 and a development contract was awarded in May 1958. The promised range, speed and time-on-station of the Orion was an order of magnitude better than previous patrol planes and reduced the need for a seaplane/tender system based near areas of interest.

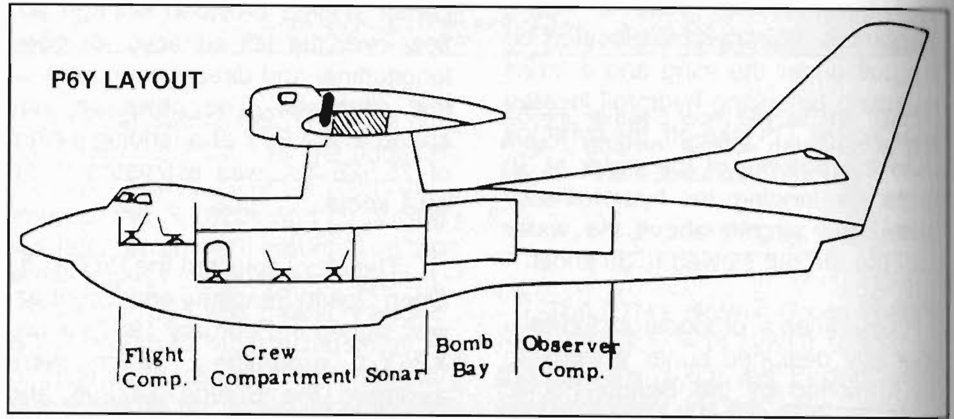
Although the AN/AQS-6 Seaplane Sonar appeared to meet its design objectives, the VX-1 operational testing highlighted serious operational limitations to a Seaplane Sonar system. No pilot in the world would attempt routine landings and take-offs in the open sea at night. While waterborne in the open sea, the aircraft was tossed about like a cork and the crew had difficulty performing their duties. Furthermore, there was no practical way for a single aircraft to convert a sonar contact to an attack. If a contact was made, before the aircraft could move in for an attack, it was necessary to retract the sonar, losing contact in the process. Although the original concept called for the aircraft to then taxi to the last known position of the contact and drop homing torpedoes, this technique was really not practicable except under the most benign sea conditions.

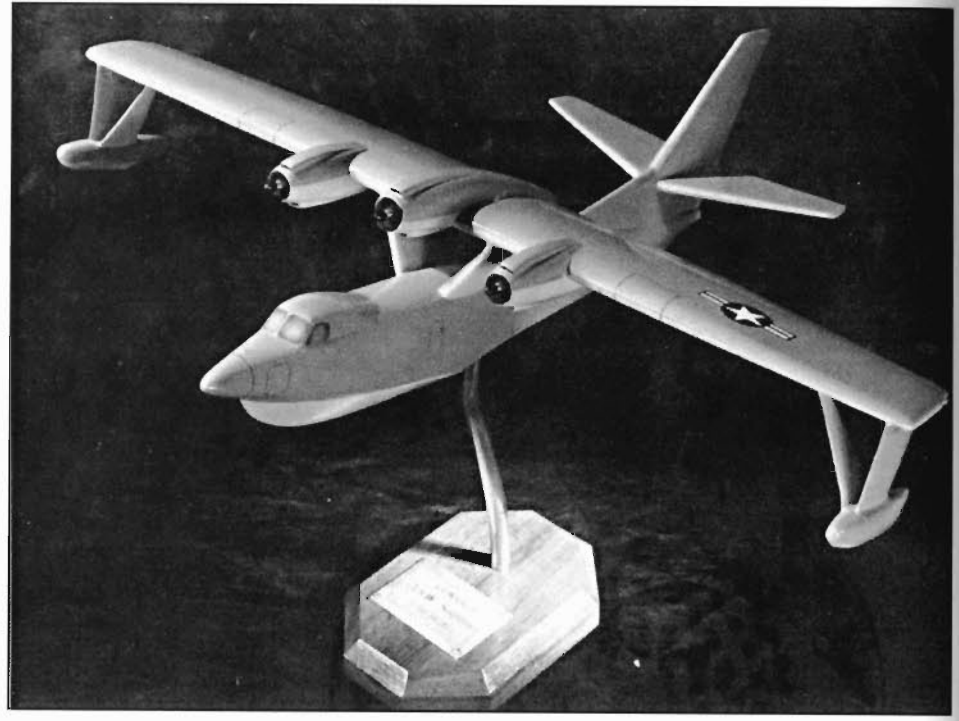
During this era advances in the practical application of the long ranges of low frequency sound detection had led to deployment of the shore-based SOSUS (Sound Surveillance) system and aircraft-delivered LOFAR (Low Frequency Analysis and Ranging) sonobuoys. The success of these systems reduced the need for a sonar equipped seaplane.

The cancellation of the P6Y was most probably due to a reordering of Navy priorities. The cost/benefit of the Open Ocean Seaplane placed it low on the priority list. The cancellation of the P6Y ended U.S. Navy flying boat procurement.



At top and bottom, model of the Convair XP6Y-1. (Convair) Below, general layout design drawing of Convair P6Y-1 Open Ocean Seaplane. (Convair)





THE MARLIN AS THE SEAPLANE SONAR TESTBED

AIR TEVRON ONE

In June 1957, after receiving a Masters Degree in Seaplane Hydrodynamics at the Stevens Institute of Technology, I was ordered to Air Development Squadron One (VX-1) as a project pilot/engineer on the P5M Marlin. VX-1 used the Marlin as a platform for the operational test and evaluation of Anti Submarine Warfare (ASW) equipment: radars, electronic intercept receivers, magnetic anomaly detectors, and sonobuoys.

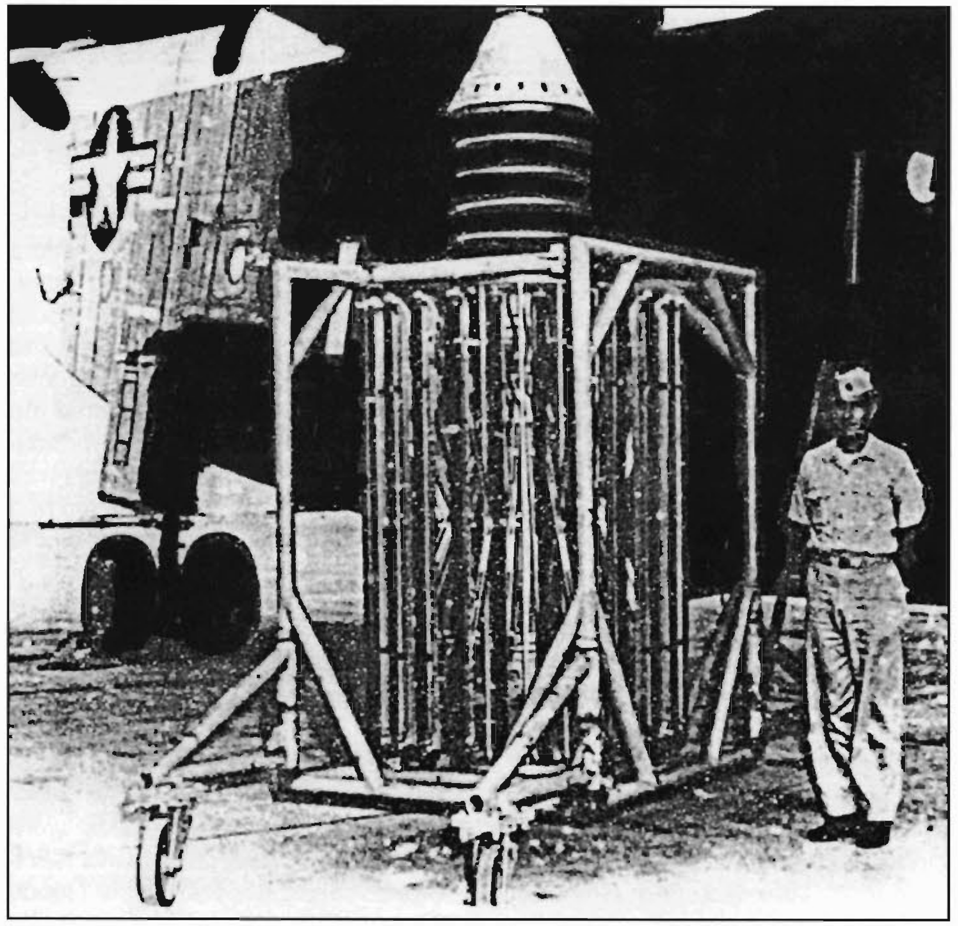
With the growth of the Soviet submarine threat after WWII and the development of Soviet submarine-launched nuclear missiles that could threaten the United States, the U.S. Navy explored every conceivable physical phenomena useful in the detection, localization, tracking, and destruction of enemy submarines. Sonics seemed to be the only reliable detection system, despite the promise shown by infrared detection, exhaust emission detectors, plankton detectors, blue-green lasers, and Japanese "C." Therefore, sonobuoys were given directional capability, small explosive charges were used with passive sonobuoys to make a crude active system called "Julie," and helicopters and airships were equipped with dipping and towed active sonars. Explosive charges as sound sources were also used with these sonars to make the "Gilda" system. All of these schemes had a low search rate, which limited their operational utility, particularly in the search phase. In the quest for higher search rates, the concept of a truly open-ocean seaplane as a platform for a large active/passive sonar was born. The Office of the Chief of Naval Operations issued an Operational Requirement which required future ASW seaplanes to land, take off, and maneuver in the open sea. A competition had been held to follow the Marlin with a new flying boat capable of routine, open-ocean operation. The competition was won by Convair with its XP6Y-1 in February 1957.

While detailed design of the XP6Y-1 proceeded, the Bureau of Aeronautics awarded a contract to the Martin Company for modification of two P5M-2 aircraft (BuNos 140146 and 140147) to serve as test beds for the installation and development of a prototype seaplane sonar. This allowed for evaluation of the sonar seaplane concept before committing to series production of the P6Y. Under sub-contract to Martin, the Raytheon Manufacturing Company designed and built the AN/AQS-6 (XN-2) Seaplane Sonar in accordance with Martin design objectives and technical data requirements. The evaluation of the seaplane sonar concept was assigned to VX-1. From its Key West base, the squadron could work against actual submarine targets in relatively benign sea conditions. My background in seaplane design, and operational experience flying the JRM Mars and the PBM Mariner, earned me the designation of Seaplane Sonar Project Pilot. LT Reynolds Beckwith, an Acoustics Engineering postgraduate, was Sonar Engineer.

With no previous P5M experience, I spent most of 1957 checking out in P5M-2 BuNo 135533 and flying routine equipment tests. In late 1957, CDR Richardson Phelps and I flew to the Martin plant in Baltimore to take delivery of the first sonar test bed aircraft. The sonar P5M was fitted with Curtiss Electric propellers from a B-29. While waterborne, their pitch could be adjusted by special toggle switches for the precise thrust control necessary for "hovering" over the sonar in order not to tilt the sonar transducer. Since the engines were running without the cooling of forward motion, seawater pumped through special heat exchangers cooled the engine oil. The sonar transducer weighed 1,200 pounds, was about ten feet tall, and when stowed within the aircraft had a diameter of about three feet. When in the water the array was expanded to a 52-inch diameter. The transducer entered the water through a hole in the bottom just aft of the main step. The hole was the bottom of a standpipe; the top had no cover, since it was well above the waterline. Because the hole was aft of the step and therefore not in an area of dynamic pressure, the water level did not rise in the standpipe during taxi or planing.

Detection and localization were and still are only part of the ASW equation. The test-bed P5Ms were also equipped with variable incidence torpedo launchers that would launch submarine-homing torpedoes while the aircraft was on the water. Although these launchers performed satisfactorily during Martin Company tests in the swell-less Chesapeake Bay, I had my doubts that they would be very useful in the open sea.

We checked out the aircraft and the sonar in the Bay and found that although the electrical/mechanical systems functioned satisfactorily, the sonar itself was not completely debugged and was really not ready for evaluation. Since this was more a development than an operational acceptance project, however, it was decided that the debugging could best be done at Key West. So we took delivery and headed south. Debugging, as usual, took much longer than expected. Starting in January 1958, preliminary work involved mostly practicing open-sea landings and take-offs, operation of the sonar mechanical systems, and water hover. After determining the availability of the target submarine (which was in great demand for other testing), we had to schedule a safety/rescue boat and hope that the aircraft and the sonar would be ready.



Above, only known photo of the seaplane sonar transducer, with Chief Sonarman Norm Nicholson standing by AN/AQS-6 (XN-2) sea unit in 1958. Transducer is in its ground handling carriage with the hydrophone array extended. (USN)

Then we would reserve an operating area and schedule the test about a week in advance. On the morning of a scheduled test, we would pray for "just right weather" for the very weather-sensitive P5M. After all, it was only a testbed for the sonar and was never designed for routine, safe operation in the open sea.

To ensure the safety of the aircraft and its crew, the commanding officer of VX-1, Capt Waller C. Moore, provided the project pilots a guidance principle that open-sea landings and take-offs should be made only under perfect conditions. Because getting the test aircraft and the sonar to the open-sea operating area was the key to the test program, I reviewed all the literature I could find on open-ocean seaplane operations, perhaps the most valuable being the booklet on ditching at sea by Capt D. R. McDiarmid, U.S. Coast Guard. I also talked to many pilots who had made open sea landings or who claimed rough-water experience.

The basic physics involved dictated that impact force be proportional to the vehicle mass times the square of the impact velocity. The pilot could keep mass low by flying at as light a weight as possible, which had the additional advantage of minimizing stall speed; I could minimize velocity by touch-down technique. The velocity that produced impact forces was the vector sum of the aircraft's horizontal and vertical motion and the horizontal and vertical motion of the ocean surface. The pilot could minimize the aircraft's vectors by flying a slow, flat approach, and the ocean's by the proper selection of a landing spot and heading relative to the moving swell system. Following Captain McDiarmid's advice, I tried to land parallel to the main swell. Studies of aircraft performance data revealed an appreciable spread between the power-on and the power-off stalling speed. Therefore, in the light winds of the test area, the swell system governed landing heading. The flight path to the landing was a flat power semi-stall, with touchdown at a near-zero rate-of-descent. Because under these conditions the aircraft was in a very nose-high attitude, I waited until I could feel the sternpost dragging the water before committing to the landing. When I was satisfied that all conditions were right I chopped the throttles, resulting in an immediate power-off stall. At this point I would put both hands on the yoke and my trusty (and trusting) copilot, LT George W. East, would apply full reverse power. Both hands went on the yoke because when the aircraft stalled and the forebody fell into the water, the resultant hydrodynamic lift caused a rather violent pitch-up. Failure to control this pitch-up by rapid and positive down elevator would cause the aircraft to be thrown out of the water in a stalled condition, and then fail back in an uncontrolled and dangerous motion. With this pitch-up under control, the landing was firm, but smooth and short.

Once we were on the water, we set up for sonar testing. Our plane captain, Chief Aviation Mechanic Len Riccio, inspected the aircraft for damage, Radioman First Class Dean Buchanan sent a "safety on the water" report and George put the propellers in toggle control and activated the sea water engine cooling system. Then Chief Sonarmam Norman Nicholson lowered the transducer to maximum depth to obtain a bathythermogram. We then positioned the sonar for the best performance predicted by RayPath diagrams, and the target submarine opened the range on a predetermined pattern for active and passive trackng. After a lengthy debugging the sonar was working well for that era, particularly in the passive mode—so well, in fact, that shipping in the area interfered with our data collection. Screw noise from an over-the-horizon merchant ship could ruin a day's tests.

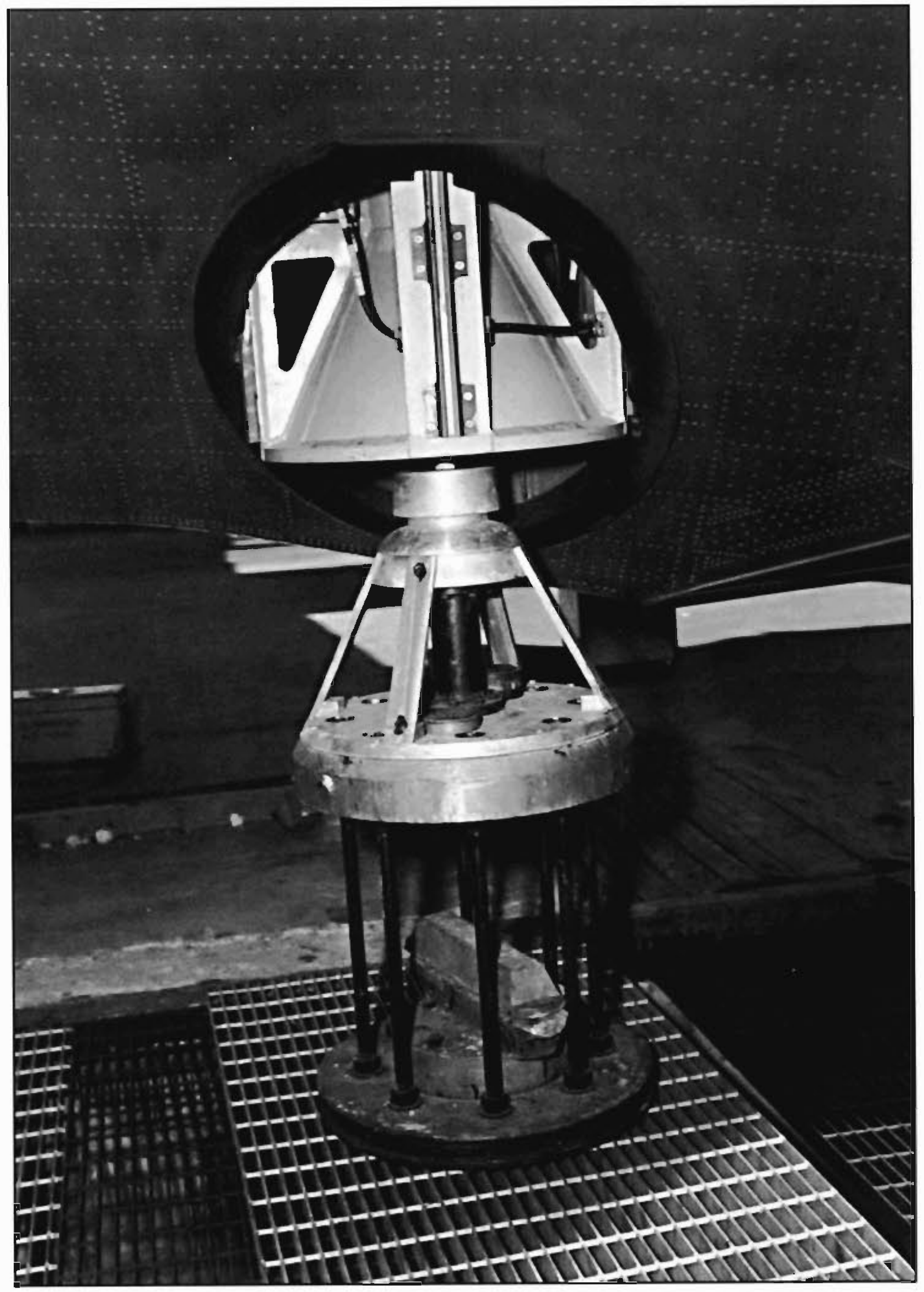
At the completion of the day's testing, or if the weather began to deteriorate, Aviation Ordnanceman First Class Bill Churchwell rigged the four jet-assisted take-off (JATO) bottles, and we would don crash helmets, strap in tightly, and prepare for an open-sea take-off, the ultimate test of a seaplane pilot's skill.

The openn-sea take-off was a much more exciting and dangerous operation than the landing. When landing, the aircraft was under complete control until the instant of touch-down. If the touch-down pitch-up was controlled, reverse power brought it to a quick and safe stop. In the take-off, the aircraft had to be accelerated from zero to flying speed. Within the low speeds of this regime, the aerodynamic controls were not very effective, and the acceleration from being a displacement vessel, through transition "hump speed" to planing and flying put the aircraft through a lengthy contact with the unpredictable sea. Especially near take-off speed, when the aircraft was still below stalling speed and with full power applied, contacting a wave at the wrong angle could throw the aircraft into the air, with a severe impact when it fell back and with any subsequent bounces leading to even more severe impacts.

The general take-off direction, like the landing, was parallel to the main swell, usually with the wind broad on the bow. I would add power slowly, keeping the aircraft just below hump speed. This gave a good feel for the sea surface motion and its interaction with the aircraft at speeds low enough to preclude any damage. If I was uncomfortable with the feel of things, I would cut the power and alter the take-off heading. When I was satisfied with the situation, I would apply full power and turn throttle control over to George. As the aircraft came up on the step at about 35 knots, I would drop take-off flaps. When stabilized on the step and upon reaching about 50 knots, I would fire all four JATO bottles. As the aircraft accelerated quickly to flying speed, I would try to keep the hull angle-of-attack with the sea surface fairly constant. If this could be done, the airplane flew off at about 75 knots, and we headed for the barn.

The danger came home when one airplane was damaged on an attempted open-sea take-off flown by an experienced alternate project pilot. Although the aircraft had to be flown to Norfolk for inspection and repair, this incident did not delay testing, since I delivered the second sonar test bed to VX-I the next day.

Although the flights were exciting and challenging, the chronology of the sonar tests is a tale of frustration. After reviewing my old report, I found that we scheduled some 91 test operations during 1958. Of these, 22 were not flown because of sea states too high for safe P5M operations, 9



Above, hoist test device for Seaplane Sonar Transducer installed in P5M-2 BuNo 140147. Device replicated weight and transducer top shape of AN/AQS-6 sonar to verify operation of sonar hoisting mechanism. (Martin)

Above, P5M-2 BuNo 140146 in September 1957 was one of two Marlins assigned to VX-1 that were involved in the open ocean seaplane sonar tests. (USN)

because of aircraft problems, 1 because of a search-and-rescue mission, and 25 because the sonar was not ready. Of the 34 actual test flights, only 15 yielded good data against a submarine. Not until late August did the engineers solve most of the sonar's development problems. With pulse width doubled, we started to get meaningful results. In September, the sonar began to live up to its design potential, and we achieved active ranges of 13,000 yards, explosive echo ranging ranges of 17,000 yards, and passive ranges against a snorkle of more than 30,000 yards. As we were preparing for maximum-range tests, we received word that the P6Y program had been canceled and that the Navy had no more need for seaplane sonar. We flew a few more flights in order to write a close-out report on the sonar and turned in our sonar P5Ms to be converted back to fleet configuration. Although the AQS-6 sonar showed tremendous potential for the era it really had no viable platform after cancellation of the P6Y. It was too big and heavy for the helicopters of the time, and since it had to be stationary in the water, it was not suitable for airship deployment. I had hoped that it might work with hydrofoil patrol boats, and I pointed out its potential to the hydrofoil desk in the Bureau of Ships. Hydrofoil patrol boat development had its own problems, however, and the last time I saw the sonar transducer was in a storage yard at the Naval Air Development Center in the mid-1960s. The Navy subsequently provided technical data on the sonar to the Japanese, under a data exchange agreement for the development of their PS-1 flying boat.

I believe that the P6Y program was canceled because of the development of the sound surveillance system (SOSUS) and the "Jezebel" low-frequency analysis and ranging (LOFAR) technique. The former provided an area initial detection, and the latter gave aircraft a respectable ASW search rate through a simple sonobuoy. With these technological advances, the operational requirement for the open-ocean seaplane disappeared.

During the tests, a number of operational problems surfaced that would limit the effective tactical employment of seaplane sonar. The aircraft was very uncomfortable while waterborne: it bobbed like a cork, and the crew became susceptible to seasickness. (Some later work was done by Convair with "spar buoy" floats to minimize this motion). Keeping the sea unit in the proper vertical position was nearly impossible for any length of time with manual "water hovering." Some type of automatic hovering would be necessary for operational use. Attack of the target presented another challenge. With the sonar deployed, the aircraft was an 84,000-pound sonobuoy tethered to the transducer. To make an attack, it would have been necessary to break contact, retract the transducer, and taxi or fly to a torpedo-drop point. We found that to be extremely time-consuming, and taxiing rapidly in any normal sea state would have been extremely difficult. We never bothered to test the variable-incidence torpedo launchers for these reasons. We concluded that for the sonar seaplane to be an effective weapon system, it would have to operate in "leapfrogging" pairs, with the waterborne aircraft holding contact and its airborne partner making the attack. We made one test flight of this technique, and it worked well. But even so, the very thought of night open-sea landings_and takeoffs, even in a 35-knot short take-off and landing aircraft, made my blood run cold.

Nevertheless, the seaplane sonar concept stayed alive in the West for a number of years. The Japanese Shin Meiwa PS-1 open-ocean seaplane, which first flew in 1967, was originally designed around a dipping sonar, although I suspect this was done more to justify an aircraft capable of rough-sea operation than for the sonar's ASW utility. Periodically, the idea surfaced in the United States to use the seaplane for a rapidly deployable towed sonar array. As Commander, Oceanographic Systems Pacific, I participated in a number of discussions of the idea. As much as I loved seaplanes and believed in their military utility, tales of my experiences with the 84,000-pound sonobuoy often dampened the enthusiasm of proponents.

Although the seaplane sonar concept was an ASW cul-de-sac, in 1957 it was not a stupid idea. It was developed at a time of near-desperation in ASW, when every conceivable avenue to submarine_detection had to be explored. It was a project from the era that predated Secretary of Defense Robert McNamara: two prototypes could be built, tested, and evaluated in an operational setting for less money than it now costs to generate mountains of paper "analyses."

UNIQUE MARLIN LANDINGS:

An oft-quoted statement of Andre Priester, the Chief Engineer of Pan American Airways during the flying boat days: "The flying boat carries its runway on its bottom" implies that the flying boat is capable of routine operation on any body of water. However, in U.S. Navy practice, flying boat operations were restricted to defined "seadromes": facilities with marked sealanes, mooring buoys, fueling and support facilities and safety crash-boats. These seadromes could be fixed installations, part of a shore base, or mobile, established and supported by a seaplane tender. Off seadrome landings were considered an emergency evolution. Because of its poor single-engine performance, the Marlin made more than its share of emergency landings.

Although at least three Marlins broke up and sank after an emergency landing at sea, many other Marlins survived these landings and the seagoing adventures that followed. The tales of those adventures are a tribute to the sturdy construction of the Marlin and to the airmanship and seamanship of Marlin crews.

Marlins often had to operate over land and in an emergency, a lake presented the only opportunity for a safe landing. While a lake might provide a satisfactory landing area, it was seldom conveniently situated for repair logistic support. Marlin lake landings and the subsequent successful repair and recovery are a testimonial to the initiative and resourcefulness of navy personnel.

A deliberate landing at sea can only be justified to save human life. One well-documented incident by a Marlin involved the rescue of 57 people from a Northwest Airlines ditching.

The author was able to account for 25 Marlins making off-seadrome landings and later returning to service. In the majority of these cases, the aircraft would have been lost had it not had its ability to land on water.

The stories of Marlin off-seadrome landings tell of an era of aviation history that will never be repeated.

UNIQUE MARLIN LANDINGS

P5M-1 Crewmen being rescued by Coast Guard cutter *Casco* after ditching off Bermuda on 17 February 1956. (MMA N/L June 2002)

The Marlin in the Open Sea
VP-47 in the Yellow Sea 1955:
During a routine Yellow Sea patrol, A VP-47 aircraft with LT Edwin Geeszel as PPC, developed a severe oil leak. Some 500 miles from his Iwakuni base and 150 miles from the nearest land, LT Geeszel opted to make an open-sea landing. The oil leak was quickly repaired by the crew, but one of the propellers stuck in reverse pitch. After instructions to correct the propeller problem were provided by radio communications with the squadron maintenance department, LT Geeszel took-off and completed his mission.

A Ditching in Japan 1955: On a 1955 patrol mission, Crew 3 of VP-48 with LT J.E. Garlitz as plane commander experienced engine trouble in their Marlin, and was forced to make an emergency landing in the Inland Sea of Japan near the Shimonoseki Straits. Unaided, the aircraft taxied for ten hours some 80 miles back to its home base at Iwakuni on one engine.

To keep from going around in circles under the power of one engine, the plane was steered on a straight course with the aid of its hydroflaps. The hydroflaps act as a rudder when opened separately, or as a brake when opened together. They were first used on the Marlin.

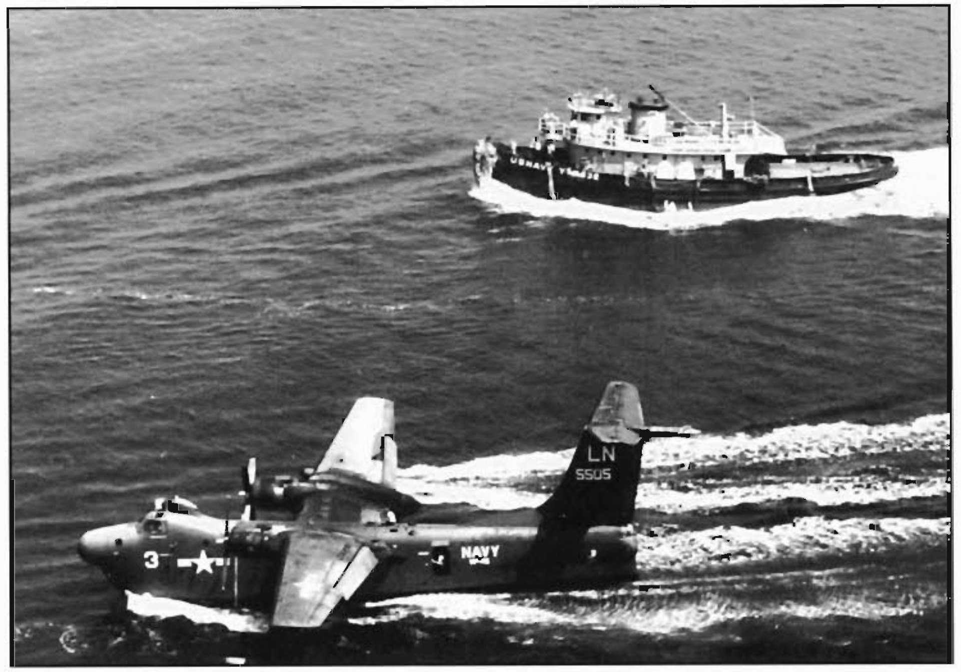
The return voyage was made in calm seas and under a warm sun and a balmy breeze. During the last six hours of the trip, the plane was escorted by a Navy crashboat.

A Bermuda Ditching 1956: LT Tyson Graham was the pilot of a Marlin which made an emergency landing in the open sea off Bermuda on 17 February1956 after developing engine trouble. All 21 men aboard, a crew of 11 and 10 passengers, and the aircraft were saved.

As LT Graham told the story in the Bermuda *Royal Gazette*: it all happened so quickly, we were flying on auto-pilot at approximately 4,000 feet when I felt a sudden veering to the left which was probably caused by a loss of power in the port engine. "Then I saw fire ... it was coming out of the back of the engine so I immediately feathered the propeller.

"We began to lose altitude and I decided to jettison everything that wasn't necessary for the safety of the plane and the men. We lost altitude rapidly...as personal belongings, equipment and gas went out. Within 15 minutes we were down to about 2,000 feet.

"I don't know just how much gasoline we jettisoned, but I kept what I thought was an ample supply to reach Bermuda. Everything went...tools, electronic equipment...



Above, VP-45 P5M-2 BuNo 135505 taxis back to Mayport some 180 miles on its one good engine after making a one-engine open sea landing in 1959. (USN)

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everything not essential for a safe flight.

"It was about one-and-a-half hours after I feathered that propeller that I decided to ditch in the open sea. The extremely high power setting necessary to keep us in the air was using more gas than I figured. Besides that, there was a possibility that my starboard engine would give out...it was running under a terrific strain.

"We were worried, very definitely worried. I wasn't scared, I didn't have time to be. When we hit, we only bounced once and stayed down. It was rougher than usual as a landing, due to the swell. There were swells six or eight feet high. We sat around and waited for about three hours until the freighter *Canadian Constructor* came along." The freighter stood by until the U.S. Coast Guard cutter *Casco* came up and took the Marlin in tow.

The cutter towed the aircraft back to Bermuda where it was repaired and returned to service.

VP-48 off Baja, California, 1956: In early 1956, a VP-48 Marlin, with LCDR A.E. Vargas as Patrol Plane Commander, had engine problems and was forced to make an open-sea landing off the coast of Baja, CA. The aircraft taxied 63 miles to San Benito Island where it anchored until recovered by seaplane tender.

A Double Ditching 1956: On 3 May 1956, two VP-48 aircraft en route from NAS North Island to NAS Ford Island, HI, were forced to ditch because of low fuel. One of the Marlins was towed into port by a USCG cutter. The USS *Wasp* (CV-18) stood by the other until it was retrieved by the seaplane tender *Pine Island.*

A Marlin in the Cape Fear River 1956: An example of mobile seaplane operations occurred at 0156, 23 October 1956, when a P5M-2 Marlin landed on Cape Fear River, near Wilmington, N.C. Flown by LT J. L. Oglesby of VP-49, the aircraft was returning from a training mission over the Atlantic. The *Marlin's* home base at Norfolk was closed by heavy clouds. CAA officials notified Oglesby that the south Atlantic Seaboard was almost entirely weathered-in. Flying south, Oglesby found an eight-mile "hole" in the weather over Wilmington, N. C. After notifying the Coast Guard Cutter *Mendota to* clear a section of the Cape Fear river nearby the P5M-2 put down for a routine landing.

The next day the plane took off from the channel and returned home to Norfolk.

VP-56 at San Salvador 1958: CDR James A. "Jim" Jones, the Executive Officer of VP-56, was returning to Norfolk from the annual winter Caribbean Springboard exercises when he experienced an engine failure in his P5M-1 and was forced to make a night open-sea landing off San Salvador Island in the Bahamas. CDR Jones tied up to a ship mooring buoy for the night, and with the help of a native, negotiated the narrow channel into the inner bay the next morning. Inspection revealed that a replacement engine was required. The submarine oiler *Guavina* was tasked to assist the downed Marlin, but the channel wasn't wide or deep enough for the submarine to enter the lagoon.

The squadron CO, CDR Douglas M. Birdsall, planned to fly the replacement engine to San Salvador slung in a P5M bomb bay. However, the Norfolk seadrome at Willoughby Bay had become so clogged with ice that a take-off was impossible. The engine ended up being sent in a Fairchild R4Q-2 Packet cargo plane.

San Salvador is one of the least developed of the Bahamas with a total population of only about 2,000 people. Aircraft support equipment was non-existent. It did have a runway that was maintained to support a Cape Canaveral downrange tracking station, and it was home to one of the first SOSUS stations, Naval Facility (NAVFAC) San Salvador. The NAVFAC had some vehicles and a small contingent of SeaBees—whose motto is "Can Do".

With the help of the NAVFAC personnel, the replacement engine was off-loaded from the Packet and moved to the shore of the lagoon where it was loaded onto a raft built

from planks and 40 gallon oil drums. The raft was floated out to the Marlin and the new engine was mounted using the Marlin's self-contained engine hoist. The installation was successful and the Marlin flew on to Norfolk.

A Ditching Off Jacksonville 1959: In 1959 a Bermuda-based P5M-2, BuNo 135505, from VP-45 took off from the Naval Air Station, Jacksonville, Florida. The patrol plane commander was LCDR James S. "Steve" Christensen, an experienced flying boat pilot who had flown PBM Mariner "Dumbo" rescue planes during World War II.

On this particular day, the clouds hung low over the ocean, so Christensen leveled off just beneath them at an altitude of about 1,000 feet. About 200 miles out from Jacksonville, the port engine suddenly lost power and stopped running. The pilot quickly moved the mixture controls to rich, hoping he could coax the recalcitrant engine back to life, but to no avail. He then reached up and pushed the button to feather the propeller and reduce drag. At 1,000 feet, there was little attitude to spare, and, having consumed little fuel at this point, the aircraft was too heavy to fly for very long on one engine. The fuel jettison system was actuated, but it was a slow process, and it quickly became apparent that the airplane would go into the water before it lost enough fuel weight to keep flying. Christensen told the crew to brace for an open sea landing, while the co-pilot broadcast an emergency "MAY-DAY" message. Seconds later, the plane settled onto a big swell with a loud smack, bounced back into the air, hit the next crest, bounced once more, and finally stuck fast on the third contact with the water. Miraculously, the aircraft survived the hard landing unscathed. Not a rivet had popped, nor had a single seam opened, but they were down in the open sea some 200 miles from Jacksonville, with little chance of getting airborne again. They would simply have to taxi the boat home.

Lashing the pedals so that the rudder was deflected just enough to keep the aircraft on course, they began their long, slow journey. Corrections in heading were made by small power adjustments on the one good engine.

About two hours after the landing, a Lockheed P2V Neptune appeared overhead and ascertaining that the problem was not critical, soon departed. A Coast Guard P5M arrived shortly thereafter and diverted a nearby liner, the *Ocean Monarch,* to the scene. The aircraft taxied in her wake for about four hours, and then the *Monarch* turned to head back toward her destination, already well behind schedule. During this time, a WV Constellation remained in company 2,000 feet overhead. Shortly after sunrise, they were greeted by a Navy blimp from NAS Glynco, GA, and the Navy tug *Umpqua* arrived on the scene a short time later, followed by the Coast Guard cutter *Aurora*. But despite all the offered assistance, the aircraft pushed on under its own power, and at about 4:00 p.m. that afternoon, some twenty-six hours after takeoff, it taxied into the turning basin at Mayport, FL, and dropped anchor. The aircraft was repaired and returned to service.

Well done, LTJG Bodensteiner 1959: *Approach* Magazine for November 1959 described an emergency open-sea landing in the Philippines: "LTJG Bodensteiner of VP-40 had been airborne for about 20 minutes on an operational flight from Sangley Point, Philippine Islands. At an altitude of 1500 feet, weighing 76,000 pounds the P5M-2's starboard engine lost power instantaneously and completely. Unable to jettison the full bomb-bay tanks (7000 pounds) because of a malfunction in the emergency stores release system and with full military rated power on the good engine, the great bird settled toward the water at 900 feet per minute. Faced with an immediate open sea landing 6000 pounds over maximum recommended landing weight and on one engine, LTJG Bodensteiner and his crew reacted automatically as a team. The ordnanceman was able to close the bomb-bay doors with the hand pump which lessened the drag. Just prior to touchdown, LTJG Bodensteiner dropped 40 degrees (full) flaps and effected an open sea landing parallel to a running six-foot swell with no injury to personnel or damage to the the aircraft. After landing, the pilot taxied 30 miles into Cubi Point, P.I., where the aircraft was ramped. Well done to LTJG Bodensteiner and his crew."

NAVY
VP-44
"WELCOME HOME" Crew 8
PATROL SQUADRON VP44
WORLDS RECORD for SEAPLANE TAXI
550 MILES ABOARD the USS PELICAN

Above, Crew 8 set "Worlds Seaplane Taxi record" of 550 miles. (USN)

Above, VP-45 P5M-2 BuNo 140142 (LN/1) stuck in the ice in 1958. (USN)

VP-44 Crew Sets Open Sea Taxi Record 1960: In 1960, aircraft LM-8 (BuNo 135481) of VP-44 had taken off from San Juan, Puerto Rico, enroute to NAS, Norfolk, VA. When some 400 miles out at sea while flying at 8,000 feet, trouble suddenly developed in the starboard engine and flames licked at the magnesium structures of the wing and engine nacelle. Pilot LT Raymond W. Myers immediately feathered the engine and started losing altitude. Working against time and making his decision on whether to land or tell the crew to bail out, LT Myers made his choice at about 1,000 feet. Three minutes after the co-pilot, LT Robert E. Deland, had sounded the original "May Day," LM-8 was resting safely on the waters of the Atlantic.

The fire, which was still blazing, had damaged the starboard wing structure and engine nacelle. Crew members formed a human chain to pass sea water up to the wing and managed to put out the fire. Above them, another P5M of VP-44 circled. It was guiding the USS *Abbott, a* destroyer which had been operating in the area, to the scene.

LT Myers asked his navigator, LTJG Rodney D. Haid, for a course back to San Juan. "I figured it was about 460 miles away and we would make it," said Myers. The aircraft's navigation gear was unharmed, and for the first 45 minutes LTJG Haid used it to plot their course. Then *Abbott* came alongside and directed the plane to proceed to Grand Turk Island, British West Indies, to rendezvous with the USS *Albermarle,* (AV-5), the seaplane tender which had supported the squadron in San Juan. *Abbott* would escort the stricken craft to the island, 200 miles away.

Upon reaching Grand Turk, specialists from *Albemarle* inspected the plane and found it damaged beyond the repair capabilities of the tender. *Albermarle's* report described the damage: "Fire damage to entire accessory section. Cowling flaps and fairing burned beyond repair aft of exhaust section past main wing spar. Engine appears drooped approximately one foot. Probably heat damage to main wing spar. Am refueling and provisioning aircraft for escort or tow to Guantanamo."

If *Albermarle* were a standard large seaplane tender (AV), the story would have ended here. A standard AV was capable to lift the aircraft on board and return it to a repair facility. However, *Albermarle* had been reconfigured to service the P6M SeaMaster and no longer had a crane capable of lifting a Marlin.

Therefore, a decision was made to taxi the plane to Guantanamo Naval Base, Cuba, with *Albermarle* as escort. All 13 men of the plane crew volunteered to stay with their "ship" during the ride back to "Gitmo." Crew members lived aboard the plane, and went over to the tender at certain times for "hot chow and showers."

LT Myers said that the plane taxied between 9 and 11 knots, averaging about ten knots for the entire three-day period. Co-pilot Deland said, "We had clear weather all the way." Sunday evening, two days, 6 hours, and 52 minutes, and over 550 miles after their emergency landing, the aircraft and weary crew arrived at the Naval Base, Guantanamo Bay, Cuba.

BuNo 135481 was repaired at Guantanamo Bay by a mobile repair team from the Overhaul and Repair facility at NAS Norfolk. It was then ferried back to Norfolk where permanent repairs were made. The aircraft was returned to fleet service and served until all P-5s were scrapped in 1967.

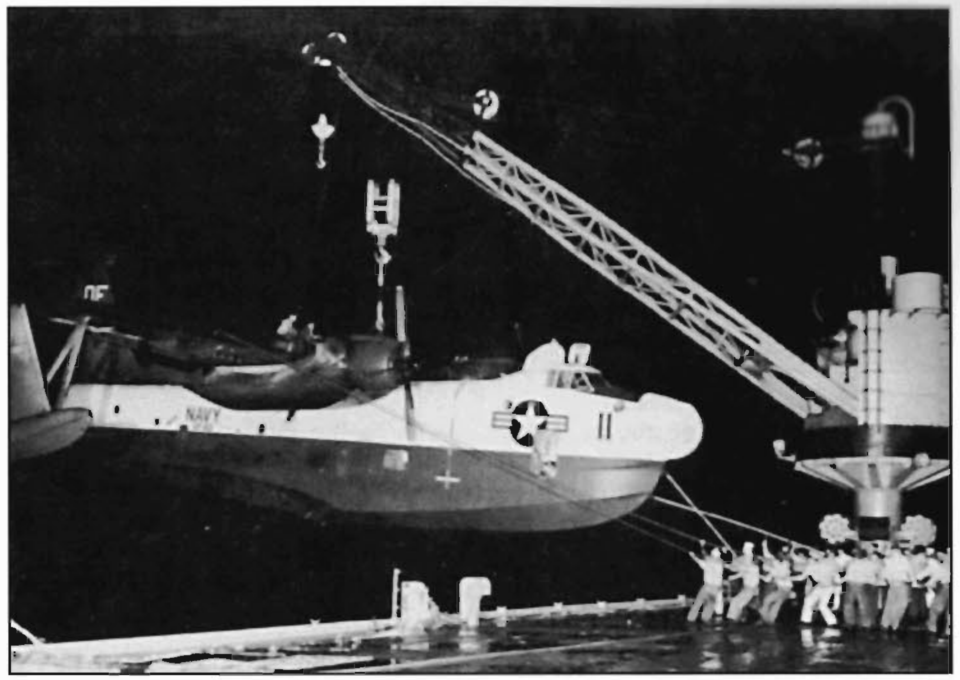
Almost to Bermuda 1960: In 1992, retired U.S. Coast Guard VADM Clyde E. Robbins told the story of his 1960 Marlin off-seadrome landing: "My next-to-last flight in the Marlin was a bit ignominious. I was sent to Bermuda from St. Petersburg, FL, for a hurricane evacuation. You remember the days when we escaped hurricanes by flying to some exotic place, leaving the wives and children to fend for themselves? We arrived in Bermuda without a problem. After waiting out the storm, we were told to fill the tanks and proceed to perform a hurricane survey around Key West before returning to St. Pete. My copilot, Mike Goodroe, was close to his First Pilot check in the airplane so I thought it would be good experience for him to make the maximum-gross-weight takeoff. He did it superbly and we were on our way. Little did he know he was in for a real test.

"About 125 miles out of Bermuda, the right engine suddenly quit—no warning, no nothing. A quick run through the emergency procedures was to no avail and we were heavy!! Mike immediately went for the bomb bay tank salvo switch which was on his left console. Wouldn't you know someone had wired the safety switch cover with safety wire instead of breakaway wire. Mike's fingers were dripping with blood and we both were using expletives (like "Oh Piffle"), before the flight mechanic showed up with a set of dikes. How long all that took I have no idea, but it was obvious that much of the 5000 feet we started with had evaporated.

"And when things go bad, they just get worse, it seems. Activation of the salvo switch should have resulted in a 7-second sequence. Bomb bay doors open; bomb bay tanks with 6600 pounds of fuel out; bomb bay doors close. Simple... Those systems were tested on every check and never a problem. Further, if the salvo switch didn't work, we always had the hydraulic manual system. To make a long frantic story short, the only parts of the sequence that worked was that both bomb bay doors opened and the front end of the right tank dropped down into the slipstream—the left one never budged. Needless to say we were well above single engine weight. Single engine performance was always marginal but with those bomb bays full it was only a question of when we ditched in the 8-10 foot seas below us.

"We immediately started jettisoning fuel, but that was interminably slow. The flight engineer tried everything in the book in the 3 or 4 minutes he had before we'd be in the water. I of course was not exactly a cool cat at that moment. If we were going in I wanted to get those doors closed but with a tank full blocking the right bomb bay doors, it didn't seem like a great idea to try closing them. Napalm under a Wright 3350 might spoil our whole day. Eventually, (it was probably only a couple of minutes that we fooled with it but it seemed like a lifetime) the right tank decided to leave us. We immediately closed the bomb bay doors and low and behold! with full power on the left engine, we stayed in the boundary layer and airborne! We still had a left bomb bay tank full but by pumping it into a main tank we could eventually get rid of that fuel.

"We then continued to jettison fuel and started throwing everything that could be torn loose over the side.



Above, P5M-2 BuNo 135479, squadron number QE/11, being hoisted at night aboard *Pine Island.* (USN)

(I was later told that when the claims were turned in, that everyone aboard had a full tool box, several suits of clothes and other valuables which went over the side with JATO bottles and the like). As time passed, we were able to start reducing the power on the left engine but we were all fretting over the high cylinder head temperatures. As we approached the reef area around Bermuda, we discussed the probability of that engine continuing to function. If we were going to have to ditch, we would want to do it clear of those treacherous reefs.

"It seemed to be doing fine so we crossed the reef line, still at such a low altitude it was uncomfortable. We wanted whatever help we could get from the boundary layer effect to allow us to reduce power and get that temperature down. We weren't two minutes by the reef line when old No.1 gave up the ghost—into the reef area we went! Anyone that has been around Bermuda knows that all those reefs look as if they are right on the surface. The water is so clear it is impossible to tell how deep they are. We didn't touch a thing!

"Full hydroflaps brought us to a quick stop and we immediately dropped the anchor. The left engine would still run well enough to taxi but not well enough to fly. We found out later that there was no major damage to it but all the plugs were in bad shape from the high temperature.

"A P5M sitting in the middle of the reefs off Bermuda is not a normal sight and we soon had a number of onlookers. One was the world renowned explorer-skin diver-treasure hunter, Teddy Tucker. He asked if he could help. I equipped him with a set of earphones and a mike, and stood him on the copilot's seat with his head out the overhead hatch. With most of the crew up on the wings and with his direction, we taxied back to the seadrome. We never touched bottom. He knew those reefs so well that he would have our "wing walkers' move from side to side, depending on which wing float he wanted out of the water to miss a reef.

"It was quite an experience. The right engine had chewed up its insides and had to be changed. After spending a couple of weeks in Bermuda, we returned to St. Petersburg on 22 September 1960, my last flight in the P5M. Shortly

Above, VP-50 P5M-2 on the mud flat near Eugene, OR, in May 1957 after an unsuccessful take-off attempt. (USN)

thereafter, we turned our 3 P5M-2's over to the Navy. I think we at St. Petersburg were the last to operate them in the Coast Guard."

Tourane Bay, South Viet Nam, 1960: In late 1960 a VP-40 P5M-1, BuNo 127719 with LT N.W. Kavanaugh as PPC, suffered an engine failure and was forced to land in Tourane Bay, South Viet Nam. The Marlin was recovered by the seaplane tender *Pine Island* which came in from Buckner Bay, Okinawa.

Two Marlins with the Marines 1960: Capt Bob (Robert L.) Morris of VP-56 tells how he spent Halloween of 1960. "It was Halloween, 1960, I remember that because, as a result of the diversion, I wouldn't have to go on a trick or treat exercise. For some time, I had thought about possible emergency landing spots we could use, in case of a P-5 emergency and inability to reach one of our "alternates", which you'll remember were Quonset Pt., R.I., Bermuda, and Jacksonville, FL. An obvious one, of course was the Albemarle Sound, located off the old Lighter-Than-Air (LTA) base NAS Weeksville, N.C. (where there was a nice long stretch of open water with no obstructions, and easy for the radar operator to see. Another one that I found one day, while out roaming around, was the Neuse River off MCAS Cherry Pt. N.C. So, these were filed away in my mind.

"On the day in question, at the weather briefing when I filed the flight plan, I was told that the Norfolk weather would be questionable when we returned (after dark-don't remember the time). Sure enough, shortly before time to return to base (we were about 300 miles off the coast working with a submarine), we received a message that Norfolk was below minimums (remember—300 and 1). A quick calculation showed that we had enough fuel to go to Bermuda; questionable to Jacksonville. Bermuda's weather was borderline, we found. And, if we had any engine problems going to Jacksonville, things would be pretty dicey. By-the-way, there were two aircraft. CDR Dan Herlong (Daniel W. Herlong) had the other one.

So, I decided, let's go try Albermarle Sound. I had heard a Marine Aircraft on guard channel communicate with the Cherry Pt. tower and get the weather—VFR. So, that would be my back-up. And, we needed it, because Albemarle Sound area was bad. We made an approach, letting down about a hundred feet a minute, controlled by our own radar operator to about 200 feet; no dice, and I figured that was about the height of the big blimp hangars there. So, I told Dan, "let's go to Cherry Pt.". We contacted them, and they didn't seem at all perturbed by my request. They said by the time we got there, they would have crash boats out and sweep the river and put out smoke lights to mark a landing area. And, that's the way it went—no trouble. Ron Casey was my co-pilot, and I believe he made the approach and landing in the river. We could see the lights when we crossed over the bridge over the river some five or so miles away at about 3,000 feet. They had put out buoys for us to tie up to. After doing so, and leaving a crew to stay aboard for the night (rations were brought out), the rest of us were brought in to spend the night on shore (BOQ and barracks). The next morning the planes needed fuel, so a plan was hatched to load a 5,000 gallon 6 wheel tanker onto a self-propelled floating crane barge. I don't know how they managed it without dumping the thing in the river, but soon a small flotilla of boats was on the way out. They had to hook-up several hose extensions in order to have a safe standoff and then haul the nozzle over to the plane with small boats supporting the whole apparatus. After a successful refueling operation, it was only a matter of time before we got weather clearance to head home. It was pretty foggy, but the weather in Norfolk was predicted to be above minimums (actually about 500 and 1), so away we went. And, the rest is history."

***Pine Island* to the Rescue Again:** *Pine Island* crewman Frank Notarnicola recalls: "...We helped save a couple P5s in the 2 year period I served on Piney Maru. The most memorable is the VP-40 plane that made an open sea landing as a result of an engine fire while on a search and rescue mission. The fire was put out by the crew after they were on the water, with hand-held fire extinguishers. They were able to taxi on the water for a day or so, on the one good engine. We were dispatched, while on our way to the Philippines, to retrieve the plane and crew. We supposedly made the first night-time pick-up of a P5M on the high seas. I was on the *Pine Island* V1 Division boat crew towing the plane to the ship for the aft crane lift to the ship's deck...". Although the date of this incident is unknown, the Marlin has been identified from a photo in the July 1975 Naval Aviation News as P5M-2 BuNo 135479, squadron number QE-11.

Almost to North Island 1964: John Kavali of VP-50 provided the following article from the 15 December 1964, edition of the San Diego Newspaper, *Evening Tribune* :

PLANE LIMPS BACK TO SAN DIEGO ON 1 ENGINE

Pilot Jettisons Valuable Gear During Return. 3 Ream Copters Provide Escort For Craft, Crew.

By FRANK HOGAN EVENING TRIBUNE Military Writer.

"A two-engine Navy seaplane with one engine knocked out by fire landed safely in San Diego Bay early today after flying 510 miles only a few hundred feet above the ocean. None of the crew of 11 was injured.

"The pilot, LT Robert E. Parshall, said he had to jettison between 8,000 and 10,000 pounds of valuable gear to get the plane back to its base.

"The P5M Marlin seaplane of Patrol Squadron 50 was escorted for a time by three Coast Guard and Navy aircraft. The engine fire broke out 510 miles south of Point Loma. The Coast Guard cutter *Alert* patrolled the coast in case the plane had to ditch at sea. But Parshall was able to make it to the South Bay amphibious landing area paralleling the Silver Strand. Three helicopters from Ream Field also escorted the stricken plane as it neared San Diego,

"'We were patrolling at about 3,500 feet near Alijo Rock, about 510 miles south of here off Baja, California, and were just turning around to come back, when the left engine started backfiring," Parshall said. 'The engine was shooting fire and smoke. I put out the fire with a fire bottle (internal extinguisher), and we started losing altitude. I shut down the engine and decided to come in on the right engine only,' he said.

"Parshall radioed North Island, which notified the Coast Guard.

"The pilot said he knew he would have to make the plane lighter so he had the crew throw out the bomb bay fuel cell, all internal stores, almost all the electronic equipment and "anything that wasn't tied down and some of the stuff that was."

'The problem was calculating how much weight you can keep and still get back home," the pilot said."

Above, VP-50 hull repair operation ended successfully with a jet assisted take off. (USN)

On the Beach 1967: From the *North Islander* newspaper Friday 10 March 1967: "Pilot Beaches Plane To Save From Sinking. A VP-50 pilot who beached his crippled seaplane on the Silver Strand Tuesday night has been credited with saving the craft and preventing injury to crewmen.

"The pilot, LT William M. Middlebrooks, taxied the plane onto the beach after the P5 Marlin struck a submerged object on landing in San Diego Bay. The collision ripped a hole in the hull and the seaplane began to take on water.

"CDR O.A. Kidd, executive officer of the North Island based patrol squadron, commended LT Middlebrooks for acting 'in a prompt and professional manner to prevent further damage to the aircraft and possible injuries to personnel.'

"The incident occurred during a routine training flight at about 7:30 p.m. Tuesday. The Marlin had taken off at about 5 p.m. Two student pilots, LTJG Andrew J.Graham and LTJG Norman W. Ray, were on board for instruction. LT Middlebrooks was the plane commander. LTJG Ray was in control of the aircraft as it touched down in the bay and hit something in the water. LT Middlebrooks tried to taxi the crippled plane back to North Island, but pumps on board could not control the flooding and the craft was in danger of sinking. He decided to get the seaplane to shore as quickly as possible.

Thanks to LT Middlebrooks' action, damage to the Marlin is relatively minor and it should be flying again in short order,' CDR Kidd said.

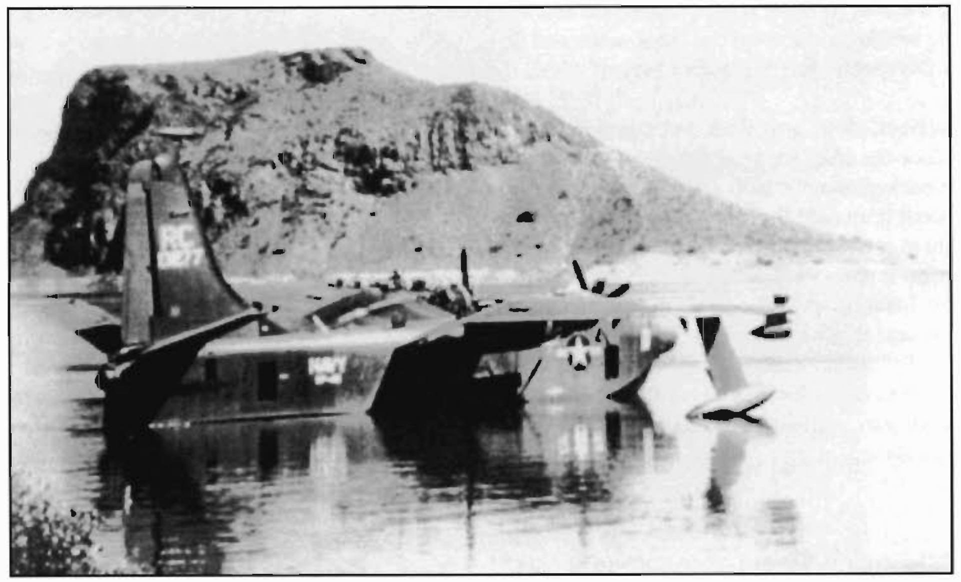
'The Marlin is being phased out of operations, but sinking is not exactly the method of decommissioning the Department of Defense recommends,' he quipped.

"Salvage operations were started on the seaplane Wednesday morning. A temporary patch was put over the hole in the hull and the Marlin was towed to North Island for repairs."

Marlins in Strange Lakes

"A Horse-Drawn Wagon and a Whaleboat" 1956: Patrol Squadron 56 left Norfolk, VA, in early September 1956 for a Mediterranean deployment. The squadron was to operate in Europe with the seaplane tender Currituck (AV-7) that had left Norfolk two weeks earlier. First stop for the planes was Argentia, Newfoundland.

From Argentia the Marlins flew on to Milford Haven, Wales and then to Pembroke Dock, England. On 14 September 1956, Jim Casteel's plane, EH-5, took off for Taranto, Italy.



Above, VP-46 Marlin after emergency landing in Elephant Butte Reservoir, NM, in June 1958. (John Wade, MMA N/L September 1998)

Jim told the story of that flight in the August 2000 Mariner/Marlin Newsletter: "Our aircraft was very overloaded, extra personnel were aboard, smoke bombs, sonobuoys and two large boxes of food the crew had all chipped in money to buy, all added to this extra weight.

"What I first noticed was the meters for the port engine generators were very erratic. I turned the port generators off and fed the plane with just the starboard generator. Notified the PPC and asked to go to "Condition One" (when the APU and one generator is used to furnish power to the plane). An Aviation Electrician, Drukker AE2, was a passenger, I asked him to come to the flight deck. About the time he arrived the port engine backfired several times, froze up and the plane started falling.

"Mr. Roberts was a great PPC and skilled pilot so he didn't have too much trouble getting the plane under control. We were losing 1,000 feet-per-minute when he ordered every thing not needed thrown overboard. All the extra munitions, supplies and those two boxes of goodies we bought, were thrown out over some mountain range in France. This got us down to losing only 100 feet per minute.

"It was a small saltwater lake (near Marignane, France) that we made our emergency landing in. It was connected to the Mediterranean Sea by what looked like a small man-made canal. The lake was boardered on one side by hills and that still had concrete bunkers from one of the wars left on them. We had not been there very long when some official looking men in a small boat came alongside and said we were going to have to stop trying to reach help with our radio, because we were interfering with all the radio transmissions around. Some of the officers from our plane went ashore with them, contacted the US Embassy, who then contacted the *USS Currituck* and told them where we were. It was near Nice, France. It took the *Currituck* six days to come and get us. Food was in short supply, most of it was laying on some mountain. Some of the crew went ashore to get some food and came back with dried peas. So we had green water and crackers for several meals. During the day we would go fishing, swim and play cards. At night we would get out on the wings, listen to the dogs barking, sing, tell stories and laugh. We made a hard time, a good time. One day a member of the crew looked up and saw a boat coming up the canal. It was from the *Currituck.*

'EH-5, a P5M-2, needed a new engine, was in a lake it couldn't get out of because the canal was too narrow. Someone came up with a great idea. A farmer was hired with a hay wagon, all of the plane crew and some of our shipmates from the *Currituck* got on the end of the port wing, pushing it down on the hay in the wagon, the starboard wing then rose over the side of the canal. The aircraft was then pulled into the sea with a horse-drawn wagon and a whaleboat. I always thought it was the ingenuity of the crew of the *USS Currituck* that got us out of this mess."

The Marlin was hoisted aboard *Currituck* where a new engine was installed. The aircraft was returned to service.

A Marlin in an Oregon Lake 1957: The June 1957 *Naval Aviation News* told of another Marlin lake landing. While based at NAS Whidbey Island, a P5M-2 belonging to VP-50 (SE-9, BuNo 135534) departed the local seadrome on a routine instrument flight in early January 1957. Not long into the flight, the weather worsened in the Whidbey area with heavy snow and diminished visibilty. With little more than five hours of fuel remaining, the pilot decided to proceed to an alternate landing site. Heading south towards the Naval Air Station, Alameda, near San Francisco, the Marlin encountered severe icing conditions and the pilot was forced to alter his flight plan again.

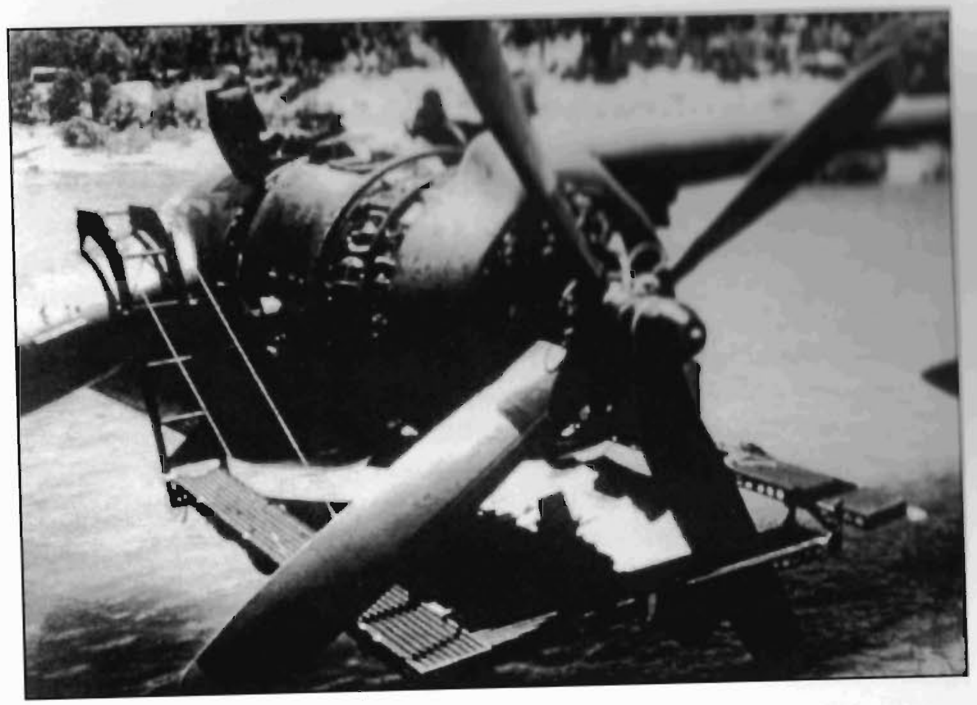
Flying at a lower altitude to avoid icing conditions, the *Marlin* was running low on fuel. Noting a fairly large body of water, the Fern Ridge Reservoir, just ten miles from the Eugene, Oregon, Municipal Airport, the pilot opted to put the big seaplane down. Landing without incident, the Navy worked with U.S. Army Corps of Engineers to refuel and prepare the aircraft for a return flight to Whidbey when the weather improved. However, during pre-flight checks the aircraft hit a submerged obstacle and ruptured the hull. In order to prevent sinking or any additional damage from occurring, the aircraft was intentionally beached on a mud flat.

It took more than a week to effect repairs to the damaged hull. Working in the cold, wet mud, maintenance crews repaired the underside of the hull and water-damaged electrical components. Once the repairs were completed, it took the combined effort of both the Portland Water District and the Army Corps of Engineers to adjust the water level in the reservoir to a depth suitable for the big flying boat to takeoff. Using a sealane of 4,500 feet, with a minimum depth of nine feet, VP-50's *Marlin* successfully departed the lake with the help of JATO, nearly three weeks after its unscheduled visit.

A Marlin in Elephant Butte, New Mexico, 1958: A VP-46 Cruisebook related a Marlin visit to New Mexico. In June 1958, P5M-1 BuNo 130277 of VP-46 developed engine trouble on a flight across New Mexico. The subsequent landing at Elephant Butte Reservoir was the start of a warm interchange of friendship between the members of the downed plane and the townspeople of Truth or Consequences. From the moment they received word of the plane's trouble to the departing date, the townspeople demonstrated a kind of hospitality never likely to be forgotten by the crew of the plane. After the crew had returned to North Island, the PPC and the Maintenance Officer were made Honorary Mayor and City Manager, respectively. The rest of the crew received certificates of Honorary Commissioner.

The engine was repaired on the lake using the aircraft "sea stands". After repairs, BuNo 130277 was flown off and returned to service.

The P Boat of the Pecos 1958: Sooner or later, everything happens to a ferry pilot. In August 1958, R. K. Jones, ACC/AP, of Aircraft Ferry Squadron Thirty One (VRF-31), was plane commander of a P5M-1 on a flight from San Diego to Baltimore for overhaul. He had LCDR R. F. Heflin (VRF-32) as co-pilot, and a crew of five. First scheduled stop was NAS Corpus Christi, TX.



Above, sea stands installed for engine repair, Elephant Butte Reservoir in August 1958. (John Wade, MMA N/L September 1998)

Approaching Tucson, AZ, problems began when efforts to use the bomb bay tanks were stymied by the failure of the starboard bomb bay tank to transfer fuel. Despite the irregularity, Jones believed he had enough fuel to reach Corpus plus 45 minutes, so he maintained a steady course for Corpus.

South of Midland, TX, after the failure of all possible combinations for getting fuel from bomb bay tanks to hull tanks, it became apparent that a change in plans was necessary. Corpus weather was deteriorating and a precautionary landing was prudent.

After consulting the Seaplane Route Manual, Jones selected Buchanan Lake, located west of Austin, TX. The revised plan and intentions were given to San Angelo Radio along with a request for a standby helo from Bergstrom Air Force Base.

While awaiting confirmation of the change of destination, Jones was contacted by Goodfellow AFB (which he affirms is appropriately named) and was informed he could land at North Lake Concho, a reservoir WNW of San Angelo.

Texans are partial to big things and the sight of a mammoth P5M attracted a good-sized welcoming contingent as it circled overhead. After sweeping the five-mile-long landing area, a smooth landing was made and the hook dropped near the boathouse area.

"We then were given a heartwarming Texas welcome," Jones narrated. "An Air Force Major along with Captain 'Pappy Joe' Treadway of the North Lake Concho Emergency Corps and owner of local radio station KPEI and two Air Force electricians were standing by when we opened the hatch. We weren't able to use the plane's galley enroute due to the transfer pump trouble, and I guess our hunger must have been showing. Pappy Joe dispatched a runner to 'Geoge Lowery's Betterburger Stand' on the double and we tackled a load of the very best Betterburgers and two gallons of coke—compliments of the house. This gesture was noted on the next newscast.

"With the Air Force bearing a big

Above, 27 May 1960 newspaper clipping from "The North Islander" of P5M-2 in El Paso Lake. (MMA N/L February 2002)

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hand, the faulty switch on the transfer pump was corrected and the fuel load evened for an early morning take-off. We split the crew, most of them spending the night on the beach.

"The next morning, with Goodfellow AFB mounting up a helo watch and after Pappy Joe directing a sweep of the sea lane, we started out. On came a starboard engine fire warning light. On boats going to overhaul this is routine, so we went through the hook-dropping ceremony again. The Air Force turned to within ten minutes and pinpointed the trouble— three loose leads.

"We got off finally and we really did bid a fond farewell to West Texas and NAS North Lake Concho, the finest seadrome between Corpus and the Salton Sea. We made a lot of friends. And the consensus of opinion of the populace was that even Texas doesn't grow boats that big!"

In an El Paso Lake 1960: Gordon R. "Rusty" Williams, who was pilot in VP-48, tells the story of a very unusual Marlin landing and take-off in the middle of El Paso, Texas: "When I was in VP-48 some of the P-5's we had in the squadron needed to go back to Weeksville, North Carolina, on the East Coast for overhaul and repair. It was decided that a ferry squadron and crew would fly them back. On one occasion the ferry pilot, who had little or no pilot time in seaplanes, called Air Traffic Control (ATC) over (roughly) El Centro, CA, and said that he had a 'rough running engine' and asked for advice as to where he could land. ATC had absolutely no idea where a seaplane could land and, at the pilot's urging, they began a search. As the pilot flew on he evidently became more and more concerned with his calls to ATC. Finally, the only thing ATC could come up with was a 2,800-foot-long municipal fresh water lake in El Paso, Texas. The pilot decided to land there, got it on the water, went into reverse so hard, I was told, that the entire radome went under water.

"While it was there, and the engine was being checked out, the Mayor of El Paso invited the Mayor of Juarez, Mexico, to come over for a tour through the P-5. The incident was, of course, in all the papers and on the nightly news. There was a USN recruiting station in El Paso and the recruiters took prospective sailors through the P-5 as an enticement to join the Navy. The P5 was used for other things, but I don't remember all the details.

"Anyway, after the engine checked out OK, the ferry squadron did not want to fly it out of the lake. Since the P-5 belonged to VP-48 the ferry squadron called our CO and asked if we would fly it out. Volunteers were asked for and the bottom line is that Bill Schad and I were elected to fly it out. We went to El Paso with one of the best mechanics in the squadron and another crewmember. We removed the searchlight, bombay tanks, all of the chairs and electronic equipment - except for one radio for communications. The equipment was put on a truck and taken to Corpus Christi. We emptied all but enough gas to get to Corpus.

"The problem was that fresh water is not as buoyant as salt water and we were riding lower in the water making it that much more difficult to get the plane up 'on the step' and then airborne. Messages were sent to Martin (the manufacturer) and to engineers in Washington asking how much fresh water we needed for a take-off run at a certain weight with a zero wind factor. We received answers that were not exactly clear but we had an idea we could make it but it would be close. Bill and I had discussions about whether to use 30 degrees of flaps all the way or to drop them to 40 degrees, for more lift, if it looked like we would not make it. We waited for a day with a good wind factor from the proper direction for the oblong lake. As we waited the newspapers, radio and TV were getting more impatient. We were told that Twentieth Century Fox had offered to pay $10,000.00 for the movies IF WE CRASHED! They didn't want them if we made it.

"The big day finally arrived. We had a better than average wind from the proper direction. Some trees at the end of the lake had been removed so we would not hit them. We got in the plane and spent some time taxiing back & forth checking the engines. We put the engines in reverse and backed up as far as we could at the far end of the lake. Coming out of reverse we went to full power while we were still moving backwards. We cleared the other end of the lake by 5 to 10 feet. Our pontoon went by or through one of the trees that was not removed. The trip to Corpus was uneventful."

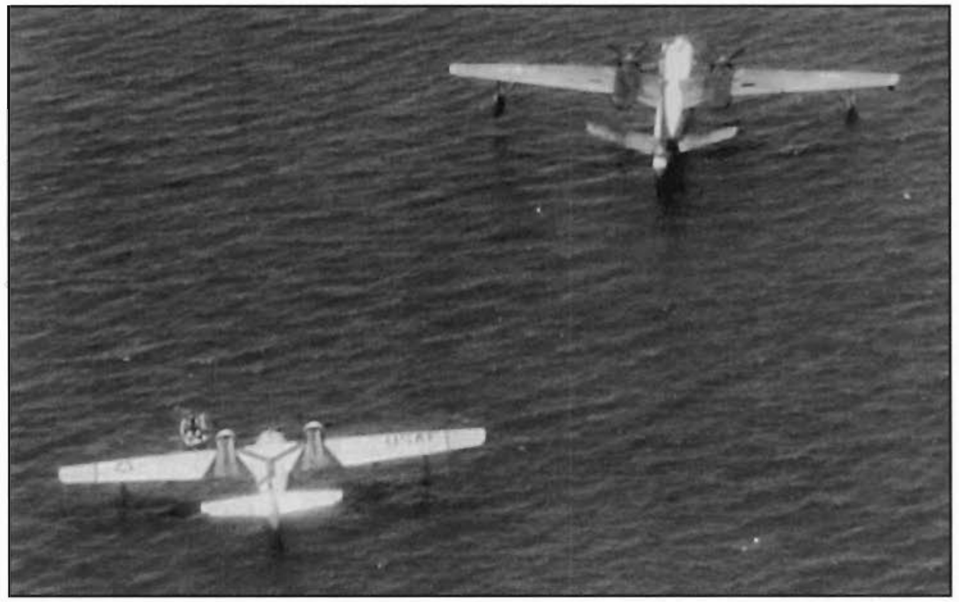
A Marlin Ocean Rescue 1960: A Northwest Orient Airlines DC-7C enroute from Tokyo to Manila ditched at sea at about 0430 hours 14 July 1960, 20 miles NW of Pollilo Island (about 180 miles ENE of Manila).

Capt. Dave Rail of the Northwest DC-7C said it all began when the #2 prop ran away and came off and sliced through the fuselage forcing them to descend from 9,000 feet. He said the passengers for the most part were senior citizens on a world tour with Northwest. No one was hurt when the prop came off and the passengers were calm. A small fire started but it was extinguished immediately.

Flying at 5,000 feet, Capt. Rail said he thought everything was fine when suddenly the #2 engine burst into flames brighter than day. The four remaining fire extinguishers had no effect. So, with no field closer than Manila, he made the decision to set it down in the water. In the middle of a torrential downpour, he set up a 200 foot-per-minute rate-of-decent strictly on the gages and instructed his copilot to watch for the water. The copilot had his hands full as he was trying to shield some of the glare from the fire so the Captain could see the instrument panel, call off airspeed and altitude and watch for the water.

Flaps and gear down and still in the heavy rain, Capt. Rail made a perfect landing despite not knowing the wind direction nor the state of the sea. Touching tail first, after three bounces the plane settled smoothly in the waves. All climbed out on the wings and the crew dispatched the 3 life rafts within three minutes. Making a quick check it was found that there were no serious injuries and all were ambulatory. While getting into the life rafts, one of the passengers, Mrs. Kelly, was washed off the wing and drowned before she could be hauled into the raft.

Search and Rescue (SAR) operations had begun as soon as Capt. Rail reported losing the #2 prop. Capt I.G. Cockroft USN (Ret), then CO of VP-40, recalls being called at about 3:30 am by his duty officer with the report: "We have a SAR alert sir, a Northwest plane out of Tokyo reported losing the number 2 prop between Okinawa and the northern tip of Luzon. They are going to try and make it to Manila. I have alerted the



Ready Crew and wait instructions from you." Before I could get out the door and head for the squadron area, the duty officer was back on the line. "Skipper, I've just launched the SAR in 5 boat with LTJG P. R. (Bob) Hite (now deceased) as PPC. The DC-7 is on fire and they are going to ditch somewhere north of Pollilo Island - - they are unsure of their exact position. I'm having the next ready plane towed to the ramp, the crew is on board, LCDR Leslie is the PPC." It was now 0410 hours.

All the stops were out now. The Coast Guard and the Navy had SAR planes airborne within 5 minutes of the "MAYDAY WE ARE DITCHING," call from the Northwest aircraft.

At about 0730 hours, LTJG Hite got a message through on the fleet common high frequency radio as he was out of voice range. "Sighted three rafts in the water, CG landed along side, I am landing now." Four minutes later another message from 5 Boat, "Sea state 3 all OK, taking on survivors." Thirty minutes later 5 Boat radioed that 17 survivors were aboard the Coast Guard SA-16 (LCDR J. D. Lyon, USGG as PC) and the remaining 41 were aboard 5 boat.

Capt Rail said he had never heard sweeter music than the sounds of the Coast Guard SA-16 and the P5M flying overhead. He really thought the sea was too rough for the

Above, Coast Guard SA-16 Albatross in the water with VP-40's 5 boat during rescue of Northwest Airlines DC-7C. (USN)

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planes to land but was so thankful they did.

A few minutes later an amplifying message came in stating that there were 57 people rescued and one fatality due to drowning while getting from the wing of the DC-7C to the life rafts. The sea was too big for the SA-16 to take off so both planes were taxiing to Pollilo Island where there was a lagoon 3 miles long. The distance was 20 miles and they would be off the air until arrival at Pollio.

By this time the incident had developed into a media frenzy, so two VP-40 pilots took off in the Naval Station's Beechcraft to establish radio contact with the rescue operation. They climbed to 10,000 feet and immediately contacted 5 Boat.

Good news! Both planes were in the lagoon but the Coast Guard plane had fouled its plugs with the long taxi and would not be able to take off (bad news). So, they were in the process of transferring all survivors to 5 Boat. But hold it a minute!

Three Air force SA-16s were cir-

Above and below, passengers rescued from ditching of Northwest Airlines DC-7C disembarking at U.S. Naval Station, Sangley Point, Philippine Islands, in 1960. (USN)

cling and dropping smoke flares, “looks like they are going to land”. About this time the SNB had radio problems and returned to base. Again no news.

Finally ADM Carson said “Cockroft, go find out what the hell is going on.” Away I went in 4 Boat. I pushed poor old 4 Boat to the limit at 5,000 feet and about 40 minutes later saw 5 Boat, the CG SA-16 and an Air Force SA-16 in the lagoon. Hite now had 42 survivors and one body aboard 5 Boat. The Air Force plane wanted to get astern of 5 Boat for another transfer of survivors but I waved him off stating that the Navy had everything well-in-hand. I had maintained good radio contact direct with COMNAVPHIL and kept a running account going for ADM Carson.

I landed, proceeded to off-load 23 survivors to 4 Boat and took-off for Sangley. As the day was dwindling away, I called out another P5 loaded with sea stands for the Coast Guard SA-16 and plenty of spark plugs.

Fifty minutes later we were on the buoy at Sangley, 5 Boat was right behind me. The beaching crew broke all records getting us up the ramp.

Led by RADM Carson and Capt. McAllister, station CO, a host of sailors, medics and newsmen swarmed to the plane’s door as the survivors started to disembark. Most were barefoot so the beach crew hosed down the ramp to cool it. One sailor offered his boots to one of the ladies. The 42 survivors and one fatality carried by the Marlins were taken immediately to station hospital. Then, all were transported to the U. S. Embassy in Manila by the 105 foot crash boat.

LTJG Hite and LCDR Lyon received the Air Medal and the crew members, the Commendation Medal.

One might ask, why not send out a boat to pick up the survivors? Because of the location, it would have taken two days for a Navy boat or ship to get there from either Sangley or Subic Bay. This is another instance in the annals of Navy seaplane operations where only a SEAPLANE could do the job!

028
NAVY
VP-40

SEAPLANE SUPPORT SHIPS

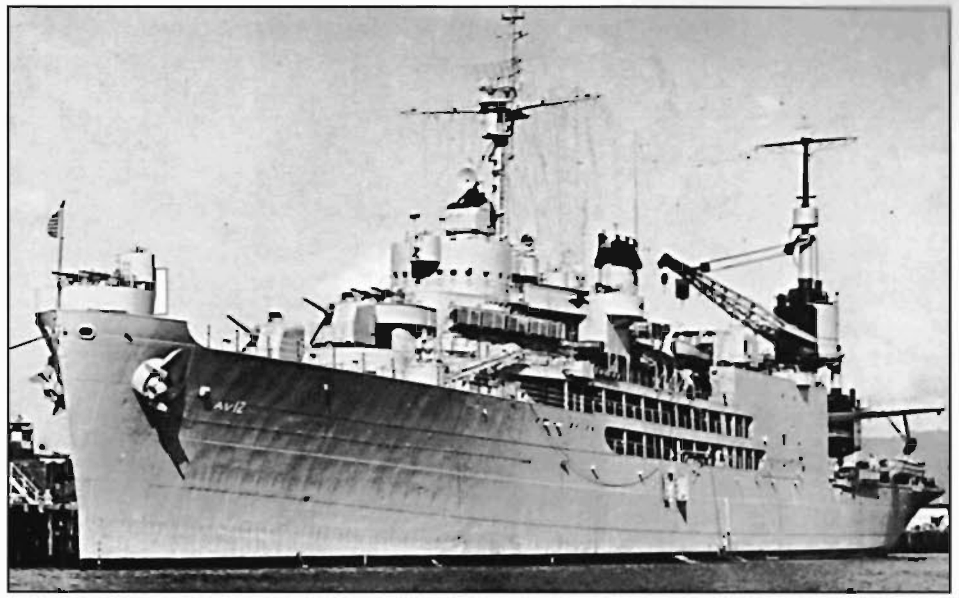
SHIPS SHIPS SHIPS

The first use of aircraft in hostilities was during the Vera Cruz expedition of 1914. Curtiss F-boats were carried by USS *Birmingham* and *Mississippi* and placed in the water by crane. On 25 April 1914, LTJG P.N. L Bellinger flew an observation flight against Mexican positions and on the 28th flew a photographic mission. These flights provided a graphic demonstration of the utility of ship-based seaplanes in naval operations..

The effective naval use of the seaplane was in a large part dependent upon having properly configured ships for aircraft support. In WWI, the British Royal Navy Naval Air Service (RNAS) pioneered the use of ship-based aircraft, with the development of the “seaplane carrier”. In the British seaplane carrier concept, single-engine float planes were carried on board to be placed in the water and retrieved by crane. In 1913, the cruiser *HMS Hermes* was converted to a seaplane carrier, becoming the first ship with the sole purpose of carrying aircraft into combat. *Hermes* also became the first of the early aviation ships to be a casualty of war, when she was sunk by German submarine U-27 on 31 October 1914.

On 8 October 1914, seven seaplanes were launched from the converted merchant ship seaplane carriers *HMS Empress*, *HMS Engadine*, and *HMS Riviera* on raids against the German zeppelin base at Cuxhaven. Although the bombs dropped by the aircraft did little damage, the raid was the first offensive use of ship-based aircraft.

During the Dardenelles campaign, on August 12, 1915, the seaplane carrier *HMS Ben-my-Chree* launched a Short S-184 seaplane to attack a 5,000-ton Turkish supply ship in the Sea of Marmora. A torpedo from the aircraft hit the ship, but credit for the kill was given to a British submarine that had launched its own torpedoes at the same time. Two days later, the *Ben-my-Chree’s* aircraft sank another supply ship and a tug.



Above, USS Pine Island (AV-12) large seaplane tender in 1954. (USN)

A cross channel steamer that had been converted in 1914 to carry four seaplanes, *Engadine* became the first seaplane carrier to take part in a fleet action. At the Battle of Jutland in 1916 *Engadine* launched and recovered a Short 184 seaplane to conduct aerial reconnaissance of the German High Seas Fleet. The plane sighted German ships and was fired upon by them but was unable to radio a report with the primitive equipment then in use. Later *Engadine* took the crippled HMS *Warrior* in tow and saved 600 of the crew when *Warrior* finally sank.

Seaplane carriers were also used by France, Germany, Japan, Italy and Imperial Russia.

Japan operated four Farman floatplanes from the seaplane carrier *Wakayama Maru* in operations against the German base at Tsingtao, China, in September 1914 and two floatplanes from the auxiliary cruiser *Chikezen Maru* in October 1917 during a search for the German raider *Wolf.*

In WWI, the large British Felixstone and American Curtiss flying boats were shore-based, but after the war the United States Navy began to develop specialized “seaplane tenders” capable of supporting large flying boats. In 1919, two large minelayers, *Shawmut* and *Aroostook*, were assigned to support aircraft. Although never formally designated as seaplane tenders, *Shawmut* and *Aroostook* operated as such throughout the 1920s, supporting Curtiss H-16 flying boats and the ocean crossings of the NC-4 and the PN-9.

The incomplete army transport *Somme* was acquired by the Navy in 1920, renamed *Wright*, fitted out as a balloon ship and designated Lighter-Than-Air Aircraft Tender #1 (AZ-1). In 1922, Wright was rebuilt as a seaplane tender and redesignated “Seaplane Tender #1 (AV-1)” on 11 November 1923. As such, she had a capacity for up to 12 floatplanes, but during the 1920s and ‘30s *Wright* functioned mainly as a mother ship for patrol flying boats, sometimes tending up to thirty-two. Wright performed valuable service in perfecting the tender-based operations of patrol squadrons. Wright was followed by collier *Jason* (AV-2) in 1930, carrier *Langley* (AV-3) in 1937 and oiler *Patoka* (AV-6) for eight months in 1939/40. In addition, in 1936 nine *Lapwing* class minelayers were designated as small seaplane tenders

Above, small seaplane tender USS Barnegat Class, circa 1959. (USN)

(AVP) as were seven *Childs* class destroyers in 1936 and 1939. Seven more old destroyers were programmed for seaplane tending and all fourteen were designated "seaplane tender, destroyer" (AVD) in 1940.

In 1937, the first of the large purpose-built seaplane tenders, *Curtiss* (AV-4) was authorized. *Curtiss* would be followed by five similar vessels of the *Curtiss/Currituck* class. The first of the *Humboldt/Barnegat* class of small seaplane tender were authorized in 1938. Twenty seven would be commissioned. In 1940 the navy acquired Maritime Commission hulls for conversion to AVs known as the *Tangier/Chandeleur/Kenneth Whiting* class. Seven would be commissioned.

During WWII, the 13 large seaplane tenders and 54 small seaplane tenders would support some 50 squadrons of Catalinas, Mariners and Coronados. The tenders and the flying boats participated in the U-Boat War in the Atlantic and all of the major Pacific War campaigns from the Mariannas to Okinawa. However, by the time of the fleet introduction of the Marlin in 1952, only 10 operational seaplane squadrons remained in service, four in the Atlantic Fleet and six in the Pacific Fleet. These 10 squadrons were supported by four large and eight small tenders.

Three of the large tenders, *Currituck* (AV-7), *Pine Island* (AV-12), and *Salisbury Sound* (AV-13) were of the *Currituck* class. The *Curritucks* were an improved *Curtiss* class and had been ordered in 1940. They were 540 feet long with a limiting displacement of 15,092 tons. The *Curritucks* had deck space for two Marlins as well as hangar space for another with its wings removed. The *Curritucks* were designed to support two squadrons of patrol planes and they carried 275,000 gallons of aviation gasoline. Their facilities included engine repair, hydraulic repair, carburetor repair, a metal shop, a parachute shop, an 18 bed hospitol and a photographic shop. In addition to ship's officers and crew, the *Currituck* class was able to billet over 120 squadron officers and 200 aircrew members. Their most striking feature was a large "flight deck" where two Marlins could be hoisted aboard and serviced at the same time. Two cranes, one on the after-deck and one on the superstructure, lifted the planes. *Currituck* was commissioned in 1944, the others in 1945. *Currituck* had been decommissioned in 1947, and *Pine Island* in 1950, but both were recommissioned in 1951 in response to the Korean War. The *Salisbury Sound* had remained in active service after WWII.

The other large tender was *Kenneth Whiting* (AV-14), first commissioned in 1944. A converted Maritime Commission C-3 merchant ship, it was 492 feet long with a limiting displacement of 14,200 tons. Although it had no hangar, it had a crane capable of lifting a P5M and had deck space for one aircraft. It was designed to support two squadrons of patrol planes and it could carry over 300,000 gallons of aviation gasoline. It had been placed in the reserve fleet in 1947, but recommissioned in late 1951 to support patrol planes in the Far East during the Korean conflict. *Kenneth Whiting* serviced both Mariners and Marlins until decommissioning in 1958.

A fifth large tender, the *Curtiss* class *Albemarle* (AV-5), had been decommissioned in 1951, but was brought out of the reserve fleet in 1956 to undergo extensive shipyard modifications to support the jet-powered P6M SeaMaster flying boat and was recommissioned in late 1957. Because the SeaMaster program was cancelled, *Albemarle* never serviced that aircraft, but supported Atlantic Fleet Marlins from 1958 until decommissioning in 1960.

The small seaplane tenders (AVP) active in the Marlin era were all of the *Barnegat* class: *Corson* (AVP-37), *Floyds Bay* (AVP-40), *Gardiners Bay* (AVP-39), *Duxbury Bay* (AVP-38), *Orca* (AVP-49), *Greenwich Bay* (AVP-41), *Valcour* (AVP-55) and *Timbalier* (AVP-54).

Commissioned between 1941 and 1946, the *Barnegat* Class was destroyer-sized, 311 feet in length with a 41 foot beam. Capable of 18 knots, they had a limiting displacement of 2800 tons. In order to maximize the space for aircraft support, the *Barnegats* had a diesel main propulsion plant, which was fairly unique for a warship in this era. Diesel drive was more compact than a boiler/steam engine plant and required less fuel.

The *Barnegats* were designed to support up to a full squadron of flying boats. They could lay sealane and mooring buoys, had extensive aircraft repair and supply facilities and provided messing and rest facilities for aircrews. Although they could not hoist a flying boat on board, they were equipped with refueling, rearming and personnel boats. They carried 85,000 gallons of aviation gasoline.

Marlin/Seaplane Tender Operations Atlantic Fleet

When VP-44 became the first Atlantic Fleet squadron to be equipped with Marlins in April 1952, on paper the Atlantic Marlins could be supported by the AVPs *Timbalier*, *Greenwich Bay*, *Duxbury Bay* and *Valcour* and the AV *Currituck.*

Timbalier was deployed to San Juan, Puerto Rico, in December 1953 where it was placed under the operational control of Commander Fleet Air Wing 11 (CFAW-11). Based primarily at Trinidad, *Timbalier* operated in the Caribbean and off the east coast of the United States, probably operating with the Marlins of Coco Solo-based VP-45 until late 1954. *Timbalier* was decommissioned on 15 November 1954.

The other three Atlantic Fleet AVPs, *Greenwich Bay*, *Duxbury Bay* and *Valcour*, although retaining the classification of small seaplane tender, in reality served as the rotating flagships of Commander Middle East Force during the entire Marlin era and no record could be found that they ever supported Marlins.

The large seaplane tender *Currituck* operated from Bermuda with Marlins of VP-49 in April and May 1954 and then sailed for a European cruise on 6 July 1954, supporting the Marlins of VP-44 at Milford Haven, England, continuing on to Taranto, Italy, and touching again at Milford Haven and Portsmouth before returning to Norfolk, VA, on 18 September.

Currituck made another European cruise between 26 August and 13 December 1956, supporting Marlins of VP-56 with the 6th Fleet in the Mediterranean. *Currituck* tended Marlins at Pembroke Dock, Wales, and at Taranto, Italy, performed the recovery of a downed Marlin at Marignane, France, and supported the Marlins at Horta in the Azores during their return to the United States.

The *Currituck* entered the Philadelphia Naval Shipyard in January 1958 for a complete overhaul and modernization. Upon completion of this work in late 1960, *Currituck* was transferred to the Pacific Fleet.

Another large seaplane tender, *Albemarle*, was recommissioned at Philadelphia on 21 October 1957 after special modifications to support the Martin P6M SeaMaster jet flying boat. After a Caribbean shakedown cruise the ship proceeded to San Juan and Trinidad, carrying out tending operations with four squadrons of Marlins and participating in the 1958 "Springboard" exercises. In July 1959, *Albemarle* supported VP-56 for an exercise at Halifax, Nova Scotia. In 1960 *Albemarle* tended Marlins during the annual Caribbean "Springboard" exercises and performed escort duty for a distressed VP-44 Marlin which was taxiing from

Below, two P5M-2 Marlins aboard the USS Currituck (AV-7). (USN)

Above and below, VP-44 P5M-1 waiting to be pulled into position for a crane hook-up from the USS Curritück (AV-7) on 9 July 1953 off the coast of Virgina. (National Archives)

Grand Turk Island to Guantanamo Bay, Cuba. *Albemarle* was placed out-of-commission, in reserve, on 21 October 1960.

With the decommissioning of *Albemarle* and the transfer of *Currituck* to the Pacific, there was no further seaplane tender support for Atlantic Fleet Marlins.

Pacific Fleet

The first Pacific Marlin deployment was made by VP-40 in February 1954. At that time, there were four Pacific Fleet AVPs, the *Corson*, *Gardiners Bay*, *Floyds Bay* and *Orca* and three AVs, *Kenneth Whiting*, *Pine Island* and *Salisbury Sound.*

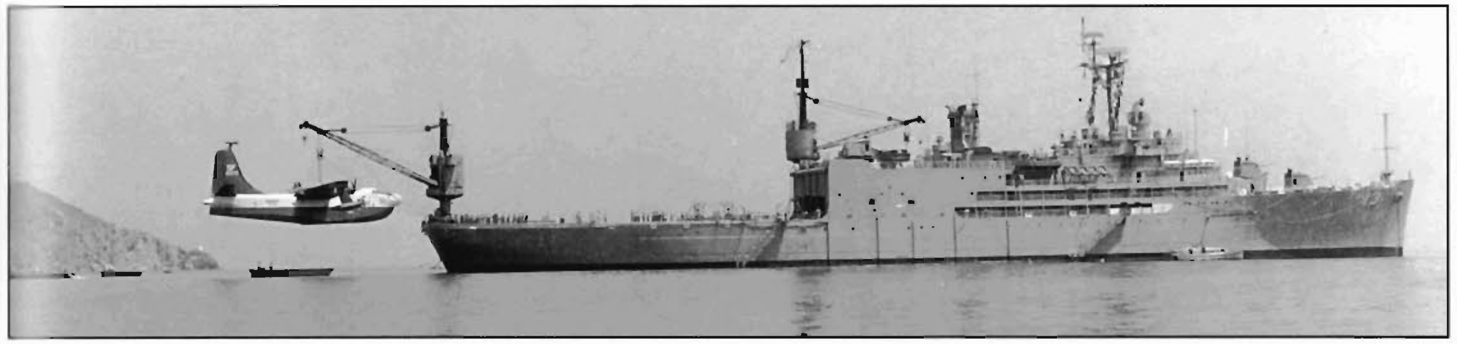
Corson tended seaplanes off Japan from January to August 1954, and again from January to July 1955. During this tour, she served as station tender at Hong Kong, conducted reserve training at Subic Bay, laid a seadrome in the Pescadores, acted as advance base support at Keelung, Taiwan, and served as plane guard off Indonesia for U.S. Air Force jet aircraft flying to Bangkok on a good-will mission. *Corson* was decommissioned in March 1956.

Gardiners Bay made three cruises in the Marlin era to support 7th Fleet operations in the Pacific (July to November 1954), (August 1956 to February 1957), and (June to November 1957). These cruises were largely spent on seaplane tending stations at Buckner Bay, Okinawa, Manila and in the Japanese ports of Iwakuni, Sasebo, and Yokohama. *Gardiners Bay* returned from its last cruise in November 1957 and was decommissioned in February 1958.

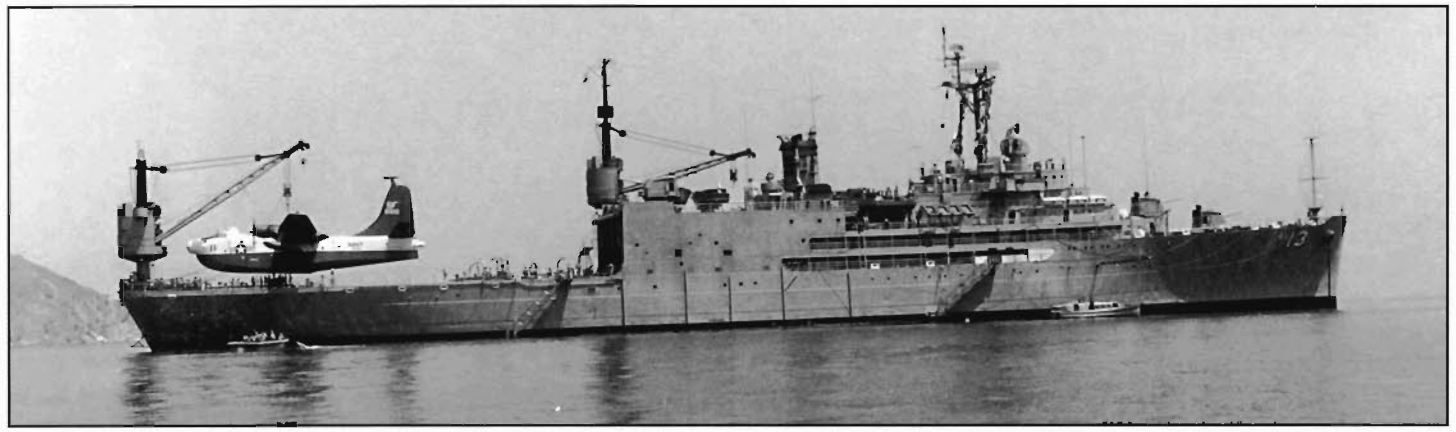
Floyds Bay had tours of duty annually from 1950 through 1959 in the Far East, serving as seaplane tender at Iwakuni, Japan, and as station ship at Hong Kong. With these cruises she alternated West Coast duty which took her from Mexico to Alaska. *Floyds Bay* was decommissioned in February 1960.

Orca assumed duty as Station Ship Hong Kong in August 1954, returning to San Diego in late February 1955. *Orca* deployed to the Western Pacific again on 11 July 1955 tending Marlins of VP-47 for advanced base operations, and returned to the United States on 1 December 1955. Following extensive training during the early months of 1956, *Orca* deployed to the Western Pacific for a seven-month tour on 24 April 1956 and filled-in as the flagship of the Taiwan Patrol Force until relieved by *Pine Island.* During a 1957 deployment, *Orca* supported Marlins of VP-42 during an exercise at Puerta Princessa, Palawan, and at Cebu City in the Philippines. *Orca* made a subsequent Western Pacific cruise beginning in August 1959 acting as flagship of the Taiwan Patrol Force and continued to service Marlins until decommissioned in March 1960.

Since 1952, *Kenneth Whiting* had made annual deployments to the Far East in support of the 7th Fleet activities. During the summer of 1955, most probably tending Marlins of VP-40, she operated in the Formosa Pescadores area in the wake of repeated Communist harassment of Chinese Nationalist islands. *Kenneth Whiting* made further deployments in 1956 and 1957. In October-November 1957 *Kenneth Whiting* tended Marlins of VP-42 at Mangarin Bay and Igat Bay in Southern Mindoro. *Kenneth Whiting* continued operations with the 7th Fleet until 31 January 1958 when she cleared Subic Bay, P.I., and returned to the United States. *Kenneth Whiting* was decommissioned at Puget Sound on 30 September 1958.



Above and below, USS Salisbury Sound (AV-13) hoisting aboard VP-48 SP-5A BuNo 126510 at White's Cove, Santa Catalina Island, on 31 July 1963. (William Swisher)



Pine Island and *Salisbury Sound* (joined by *Currituck* in 1960) tended Marlins in the Western Pacific during the entire Pacific service of the Marlin, 1954-1967. Although available *Pine Island* historical records for the time are sparse, the ship's histories of *Salisbury Sound* and *Currituck* are quite comprehensive. Taken together, the three ship's histories give a comprehensive overview of all Pacific seaplane tender operations during the Marlin era.

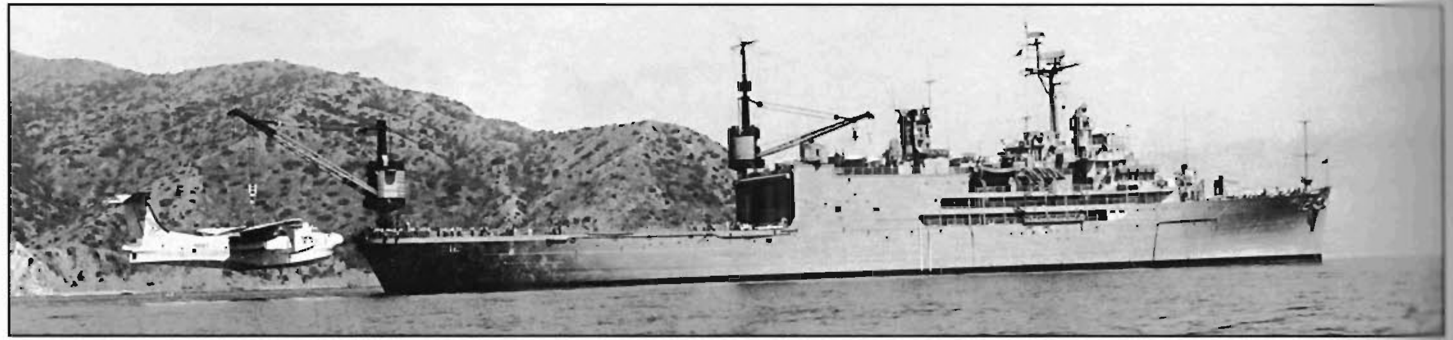
Pine Island was in the Far East from January to August 1954 during VP-40's first Marlin deployment.

Salisbury Sound arrived at Yokosuka, Japan, in August 1954 to relieve *Pine Island* as the flagship of Commander of the Formosa Patrol Force (Task Force Seventy-Two) then located at Boko Ko in the Pescadores Islands. She served as flagship of the Formosa Patrol Force during the evacuation of the Tachen Islands in February 1955. In the following months she made repeated calls at Formosan ports of Kaohsiung and Keelung, visited Yokosuka, Japan, and spent much of her time in seaplane support operations while based at Buckner Bay, Okinawa. *Salisbury Sound* returned to its homeport of Alameda, CA, in March 1955, having been relieved by *Pine Island.*

Salisbury Sound returned to Yokosuka in October 1955. Again hoisting the flag of Commander of the Formosa Patrol Force, she commenced duty at Buckner Bay, Okinawa, on 20 October 1955, making frequent cruises to Manila Bay, Kaohsiung and Keelung, Formosa. (The Formosa Patrol Force was redesignated Taiwan Patrol Force, effective 1 November 1955). After participation in SEATO (South East Asia Treaty Organization) exercises in the Philippines and Thailand in February 1956, *Salisbury Sound* resumed operations at Buckner Bay on 6 March 1956 and returned to Alameda on 12 April 1956.

Pine Island deployed to WestPac in June 1956 and visited Brunei, Borneo, in August, before returning to San Diego in December 1956.

After overhaul and refresher training, *Salisbury Sound* had departed Alameda on 13 November 1956 for Yokosuka relieving *Pine Island* as flagship of Commander Taiwan Patrol Force. Marlins of VP-40 commenced operating from her seadrome at Buckner Bay on 12 December 1956 and rescued the crew of a U. S. Air Force amphibian from the sea on 5 January 1957. In between these operations were cruises for visits at Hong Kong; Manila; Kaohsiung and Keelung, Taiwan; and Apra Harbor, Guam. Marlins of VP-46 commenced operations from *Salisbury Sound*'s seadrome on 26 March 1957 and she conducted exercises in the area east



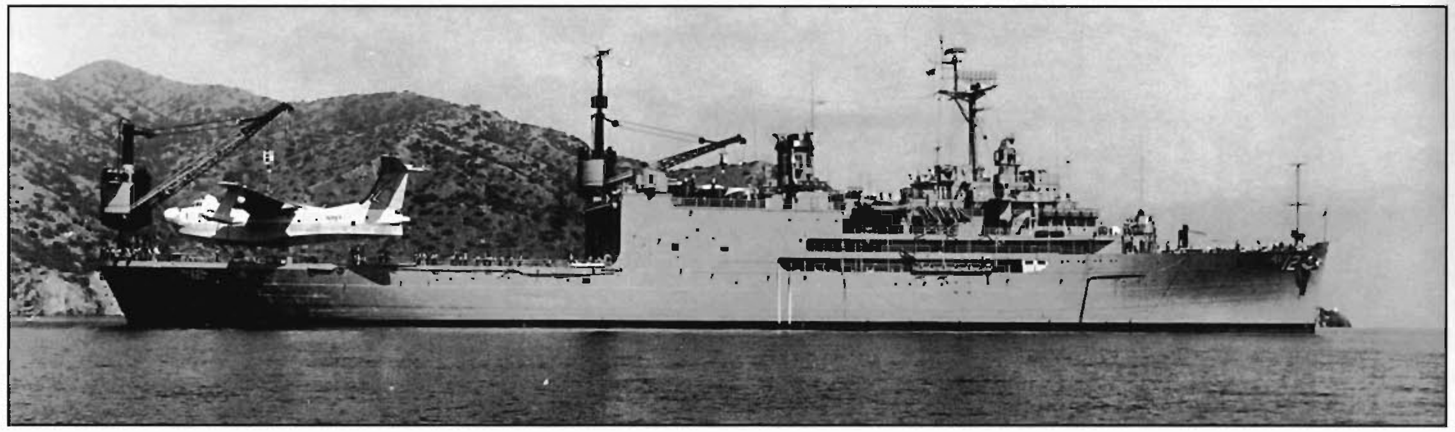
Above and below, USS Pine Island (AV-12) hoisting aboard VP-48 SP-5B BuNo 135542 at White's Cove, Santa Catalina Island, on 22 July 1965. (William Swisher)

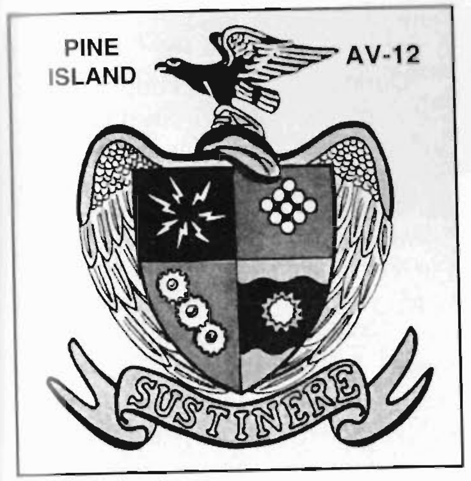
of Tsugen Jima Island before clearing port on 17 April. She touched at Keelung then visited Iwakuni, Japan, before arriving at Yokosuka on the 28th. Commander Taiwan Patrol Force hauled down his flag at Yokosuka on 6 May 1957 as *Salisbury Sound* was relieved by *Pine Island*. *Salisbury Sound* returned to Alameda on 23 May 1957. During the remainder of 1957 she participated in combined fleet maneuvers off the California coast, and engaged in refresher training exercises while operating from Alameda and San Diego.

Salisbury Sound sailed from Alameda on 8 January 1958 reaching Hong Kong on 4 February to again become Flagship Commander Taiwan Patrol Force. She commenced operations in the Philippines area on 26 February, alternating between Dingalan, Subic and Manila Bays, then shifted to Buckner Bay, Okinawa, on 18 March with occasional cruises for visits to Kaohsiung, Taiwan; Boko Ko in the Pescadores Islands; and Hong Kong. She cleared Buckner Bay on 5 June 1958 and was relieved as flagship of the Taiwan Patrol Force at Sasebo on 13 June by *Pine Island,* and returned to Alameda on 3 July 1958.

Salisbury Sound returned to Buckner Bay on 25 January 1959 and the following day relieved *Orca* as flagship of Commander Taiwan Patrol Force. Seadrome operations at Buckner Bay alternated with visits to ports in the Philippines, Taiwan, and Japan. In addition to these ports, she visited Saigon, Viet Nam, and Jesselton Harbor, North Borneo. She departed Buckner Bay on 23 June and was relieved as flagship of the Taiwan Patrol Force at Yokosuka, 30 June 1959 by *Pine Island.* She sailed from Yokosuka on 2 July and reached Alameda on 14 July 1959. In early December 1959, *Salisbury Sound* conducted seadrome operations in Drake's Bay just northwest of San Francisco.

Salisbury Sound left Alameda on 11 January 1960 for her 15th deployment to the Western Pacific, stopping at Pearl Harbor and then proceeding to Yokosuka, Japan. Following post-voyage repairs, she got underway for Kobe, where on 9 February 1960 the flag of Commander Taiwan Patrol Force was shifted from the USS *Frontier* (AD-25). She then proceeded to Buckner Bay, Okinawa, where seadrome operations were conducted until 9 March. She arrived in Hong Kong on 12 March for a 5-day visit prior to departing for Kaohsiung, Taiwan, where, along with other Seventh Fleet units, she participated in operation "Blue Star." After returning to Buckner Bay on 29 March, the *Salisbury Sound* was needed to assist a downed P5M Marlin at Fukuoka, Japan, on 14 April. The stricken aircraft was hoisted aboard and taken to Iwakuni via the Shimoniseki Straits. The ship returned to Buckner Bay on 23 April. Seaplane operations were conducted at Okinawa until 20 May when *Salisbury Sound* departed for refueling at Subic Bay then on to Sangley Point, R.P., arriving there on 23 May. She departed Sangley for Hong Kong on 26 May. After a brief visit she resumed seaplane operations at Buckner Bay. On 22 June she left Buckner for Yokosuka, arriving there on 25 June and after voyage repairs





USS Pine Island (AV-12) in April 1966. (John Rodderick)

departed for Alameda on 2 July 1960.

Salisbury Sound relieved *Pine Island* and operated as a unit of the Seventh Fleet from 1 April 1961. During this deployment, the ship performed the primary mission of providing an advanced base for seaplane squadrons and served as flagship for the Commander, Taiwan Patrol Force. Most of the ship's operations were conducted in Buckner Bay, Okinawa, where units of VP-40 and VP-50 were supported. In addition, the ship visited Hong Kong; Kaohsiung; Taiwan; Iwakuni, Kobe, Sasebo and Yokosuka, Japan. On 27 June 1961 *Currituck* began her first Pacific tour, relieving *Salisbury Sound.*

Back in the United States, on 6 November 1961, *Salisbury Sound* established a seadrome at White Cove, Santa Catalina Island, CA, and operated with P5Ms of VP-42 for three days. Other operational exercises of short duration were conducted with VP-48.

After returning from the Western Pacific, *Currituck* made an Alaskan voyage that spanned the Aleutian Islands. From April to June of 1962, she operated with VP-47's Marlins to train in advanced floating base techniques. During these operations, *Currituck* visited Anchorage, Alaska, the largest ship ever to visit that port.

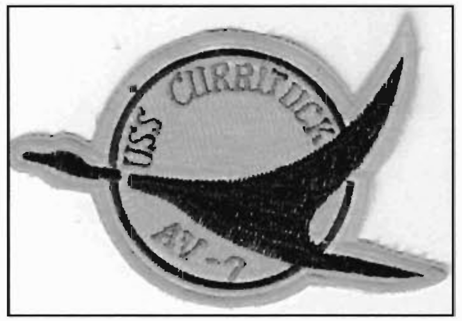
Salisbury Sound deployed to the Western Pacific on 28 May 1962, where she served as Flagship Commander Patrol Force Seventh Fleet/Commander Taiwan Patrol Force. While in port at White Beach, Buckner Bay, Okinawa, she continually maintained an operational seadrome which operated on a 24-hour, all-weather basis. While deployed, *Salisbury Sound* operated in support of scheduled exercises with VP-40 in August and September. The ship visited Yokosuka, Kagoshima, Iwakuni, Sasebo, and Kobe, Japan; plus Hong Kong; Kaohsiung; Taiwan; and Sangley Point, Philippine Islands. The ship was relieved by *Currituck* on 14 November 1962,

On 15 January 1963, *Salisbury Sound* entered the shipyard for a periodic major overhaul. When the yard period was over and sea trials complete on 16 April 1963, *Salisbury Sound* rejoined the operating forces. After a short period in Alameda for refitting and replenishment, the ship sailed to San Diego and reported to Commander Fleet Training Group for operational control and refresher training. The period 13 to 24 May was spent conducting simulated battle problems, ship's drills, and damage control problems while underway. This was followed by a week of air operations at San Diego Bay, working with aircraft from VP-48.

After completion of underway training and a short period in Alameda, *Salisbury Sound* sailed to Oak Harbor, WA, and reported to Commander Fleet Air Wing Whidbey for operational control. From 17 to 26 June 1963, day and night antisubmarine warfare seaplane operations were conducted with VP-47 embarked. These operations were conducted in Holmes Harbor, an arm of the Puget Sound. The ship departed Whidbey Island on 28 June 1963 to return to Alameda. The operational schedule for the months of July and August included an Operational Readiness Inspection (ORI) and an Administration Material Inspection. *Salisbury Sound* sailed to San Diego and reported to Commander Fleet Air Wing San Diego on 24 July for the execution of the ORI which was conducted in White Cove, Santa Catalina Island, and included the conduct of air exercises and seaplane support exercises.

Pine Island deployed to the Western Pacific in March 1963, where she operated out of Okinawa, received visitors at Chinhae, Korea, in June, and delivered fresh water to Hong Kong in August.

On 26 August 1963, *Salisbury Sound* departed Alameda for her scheduled deployment to the Western Pacific. On 7 September, Operational Control was changed to Commander Seventh Fleet and the ship was assigned to Task Force Seventy-Two. Upon arrival in Yokosuka, Japan, action began to receive the staff of Commander Patrol Force, Seventh Fleet. On 12 September, *Salisbury Sound* officially relieved *Pine Island* as flagship and *Pine Island* returned to San Diego. *Salisbury Sound* arrived in Buckner



Bay on 19 September 1963 and established a seadrome. Air operations with detachments from both VP-40 and VP-50 were conducted while in Buckner Bay. During September and October, *Salisbury Sound* also made operational visits to Yokosuka, Iwakuni and Beppu, Japan, and to Sangley Point, P.I..

At the conclusion of the port visit to the Philippines, the ship established a seadrome in the southern part of Subic Bay. From here, with VP-40 embarked, the *Salisbury Sound* was scheduled to participate in a fleet exercise, "Operation Yellow Bird". Although the exercise was cancelled, the ship conducted operational and training operations with twelve aircraft from VP-40 from 5-9 November 1963.

A port visit was made to Singapore in the Federation of Malaysia from 28-29 November. *Salisbury Sound* was the first U.S. warship to visit this port after formation of the Federation in October. Return to Buckner Bay was on 18 December 1963. The ship remained in that port for the remainder of 1963.

In January 1964, *Pine Island* departed San Diego for the Galapagos Islands, where she provided assistance to scientists before returning to San Diego in February.

On 8 January 1964, *Salisbury Sound* departed Buckner Bay for Keelung, Taiwan, and Hong Kong, returning on 23 January. VP-50 flew in three aircraft to Buckner Bay on 27 January 1964. Heavy winds and sea conditions damaged an engine and a prop on one aircraft necessitating an engine change. No sooner was this engine changed than the engine on a second aircraft failed. The second Marlin was hoisted aboard just prior to the ship getting underway for Sasebo on 3 February 1964 and the engine was changed enroute to and in Sasebo.

Salisbury Sound arrived at Sasebo on 5 February 1964 and departed for Buckner Bay two days later. On 16 February 1964, *Salisbury Sound* shifted berths to Naha Port in order to shift the flag to *Currituck.* The shift was made on 18 February and immediately following, *Salisbury Sound* got underway for her new homeport of Oak Harbor, NAS Whidbey Island, Washington, arriving there on 6 March 1964.

During the 1964 deplayment, *Currituck* operated from Lingayen Gulf in Exercise "Minute Hand", servicing VP-48. Returning once again to Manila on Sunday 29 May 1964, *Currituck* participated in Exercise "Litgas", a seven-Nation, 75 ship SEATO operation. Litgas was a massive amphibious/airborne exercise, during which *Currituck* served as Command Information Center. After the exercise, *Currituck* visited Saigon, South Vietnam, navigating up the Saigon River through hostile territory.

With only two hours notice, *Salisbury Sound* got underway from Oak Harbor, on 28 March 1964 for Kodiak, AK, to assist in recovery operations following the tidal wave that hit Kodiak Island on the 27th (the "Good Friday" earthquake). Arrival was on 31 March and parties were immediately organized to assist in the clean-up. During *Salisbury Sound's* operations in Alaska the ship provided electricity, hot water and working parties of up to 40 hands to assist the stricken station to clear debris. For these efforts, *Salisbury Sound* was awarded the Navy Commendation Medal. On 10 April the ship departed Kodiak and returned to Whidbey Island. In June 1964, *Salisbury Sound* took on provisions and fuel in preparation for a cold weather cruise. Aviation gasoline was pumped aboard from the ship's sister, *Pine Island,* and the ship's fuel tanks were topped off readying her for a 15 June departure for Cold Bay, Alaska. Once anchored in Cold Bay on 20 June 1964, seadrome operations with VP-47 Marlins commenced. On securing these operations on 30 June 1964, the ship cruised the coast of Alaska stopping at Haines, Juneau and Sitka. On 11 July, the ship departed Alaska and arrived back at Oak Harbor on 13 July. *Salisbury Sound* anchored at Oak Harbor until 10 September 1964 when she moved to Astoria, OR, and commenced seaplane operations with VP-40 for 10 days.

Below, two VP-42 SP-5Bs operating with Currituck on 14 June 1963. (USN)

On 19 October 1964, *Salisbury Sound* anchored in White Cove, Catalina Island, and commenced seaplane operations. She returned to Whidbey Island 26 October and remained there until departing for another Far East cruise.

On arriving in Yokosuka, *Salisbury Sound* moored alongside *Pine Island,* and on 1 December 1964 Commander Patrol Force Seventh Fleet shifted his flag to the *Salisbury Sound.* Four days later *Salisbury Sound* departed for Buckner Bay.

The ship spent Christmas and New Year's in Buckner Bay and on 6 January 1965 weighed anchor for Keelung. She remained in Keelung for two days and on 8 January left for Kaohsiung and then on 14 January arrived at Naha, Okinawa. She returned to her homeport overseas, Buckner Bay, on 19 January and remained there until 5 February when she departed for Manila Bay.

In early 1965, the "Market Time" coastal patrol of Viet Nam was established. Market Time was a surveillance/interdiction operation designed to block the sea supply of communist forces in South Viet Nam. The tender/flying boat system was ideally suited for this mission. Operating from the tenders stationed on the coast of Viet Nam, the Marlins would waste no time in transiting to their patrol areas.

Salisbury Sound stood off Sangley Point in Manila Bay on four-hours standby until she steamed for DaNang, South Viet Nam. For five days from 12 February 1965 she operated a seadrome at DaNang. She returned to Sangley Point and then to Buckner Bay arriving on 23 February. 22 March the *Salisbury Sound* left Buckner Bay for Hong Kong where she anchored for six days. On 31 March *Salisbury Sound* sailed for Buckner Bay arriving there 3 April.

On 30 April, the ship left Buckner Bay for Subic Bay, Philippines, arriving there 3 May 1965. Five days later she left Subic Bay for Manila Bay and then on to Poula Condore, South Viet Nam, arriving 11 May and setting up a seadrome the next day. On 20 May the *Salisbury Sound* secured seaplane operations and sailed for a port visit to Bangkok, Thailand. Leaving Bangkok 27 May, the ship was refueled at sea and *Salisbury Sound* arrived at Culao Cham Island, South Viet Nam, 31 May and set up seadrome operations. On 5 June *Salisbury Sound* departed for Oak Harbor, arriving on 26 June 1965.

On 10 September 1965, *Salisbury Sound* visited Juneau, AK, once again and set up a seadrome. Three days later she sailed for Kodiak where she was warmly greeted on 15 September for her timely help after the earthquake of the year before. After a five-day visit, she sailed for Anchorage and then back to Oak Harbor.

Currituck had left San Diego on Friday 23 April 1965 to become Flagship Seventh Fleet at Buckner Bay, Okinawa, operating with and servicing VP-50. During that cruise she also visited ports in the Philippines, Thailand, Vietnam, Hong Kong, Taiwan, and Japan. In May 1965 *Currituck* established a number of "Firsts." She took part in exercise "Seahorse" and became the first US ship in history to visit the Island of Ko Sumai in the Gulf of Thailand. On Tuesday 22 June 1965, *Currituck* became the first seaplane tender to

Below, three VP-48 SP-5Bs pass-in-review beside the USS Currituck (AV-7) on 12 April 1964. (USN)

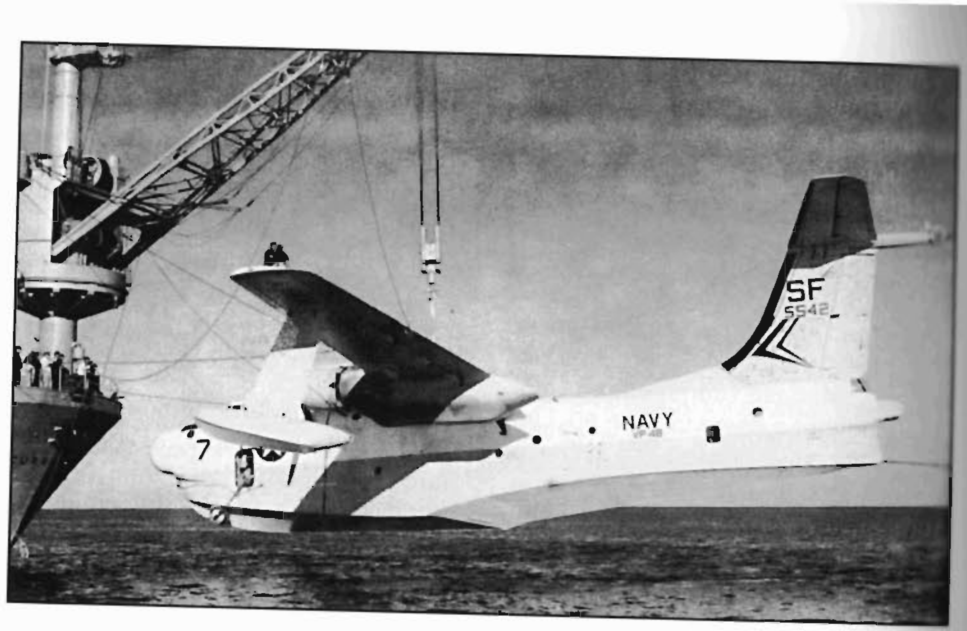
deliver shore bombardment against enemy positions in the Mekong Delta region of Vietnam. *Currituck* established a record of 67 days of seaplane operations in an advanced-base area.

Currituck returned to San Diego on 1 December 1965, and on 13 January 1966 she departed San Diego on a two-week training cruise which took her to Magdelina Bay and LaPaz, Mexico, returning to San Diego 27 January 1966.

Pine Island deployed to the Western Pacific in September 1965, where she conducted seaplane operations in Cam Ranh Bay, South Vietnam, and participated in the 1966 Coral Sea anniversary festivities in Australia and New Zealand before returning to San Diego in June 1966.

After visits to San Diego for supplies, Bangor, WA, for ammunition and Bremerton shipyards for repairs, the *Salisbury Sound* departed the United States from San Diego 5 February 1966 for Yokosuka. The ship left Yokosuka 23 February and made quick stops in Kobe, Japan, and Buckner Bay before getting back to the business of tending her seaplanes in Cam Ranh Bay, South Viet Nam. She arrived there on 4 March 1966. On 26 March 1966, the ship secured her seadrome operations and left Cam Ranh Bay for Subic Bay, P.I., arriving there two days later for a five-day stay before steaming to Hong Kong and Buckner Bay.

In May, *Salisbury Sound* departed Buckner Bay for Keelung, Taiwan, and after three days in port there, the ship headed for Kaohsiung, Taiwan, arriving 9 May. Returning to Cam Ranh Bay, South Viet Nam, on 15 May, the ship set up her seadrome and tendered her planes until 3 June, when she steamed for Bangkok, Thailand, for a four-day goodwill visit. She went back to Subic Bay for provisions before beginning nearly three months of seaplane operations: in Buckner Bay from 17 June to 6 July, in Cam Ranh Bay from 10 July to 6 August, and again in Buckner Bay from 12 to 29 August.



Above, VP-48 SP-5B BuNo 135542 being hoisted aboard the USS Currituck (AV-7) in Philippine waters in 1964. (USN)

On the 29th, the ship headed for Sasebo, Japan, for a goodwill visit arriving 31 August. *Salisbury Sound* pulled out of Sasebo 9 September and returned to Buckner Bay for fueling and supplies. The ship departed Buckner Bay 27 September for Subic Bay, where she moored alongside *Currituck* on 30 September, and transferred the Commander Patrol Force Seventh Fleet to *Currituck* before heading on to Cam Rahn Bay on 5 October.

During her last operations in Cam Rahn Bay, from 7 to 27 October, the ship pumped her millionth gallon of aviation fuel to her attached seaplanes, setting a record for a seaplane tender for number of gallons pumped during one cruise. On 27 October 1966, the *Salisbury Sound* hoisted a homeward bound pennant and steamed out of Cam Rahn Bay for the last time.

Two Marlins were carried from Cam Rahn Bay to Sangley Point. After off-loading the Marlins at Sangley Point, the ship sailed for Subic Bay, arriving the same day, 29 October. On 2 November 1966 *Salisbury Sound* pulled out of Subic Bay and started across the Pacific. *Salisbury Sound* pulled into Oak Harbor on 21 November 1966. *Salisbury Sound* was decommissioned on 31 March 1967.

Pine Island deployed again in early 1967 and serviced VP-40 at Cam Ranh Bay. *Pine Island* was decommissioned 16 June 1967.

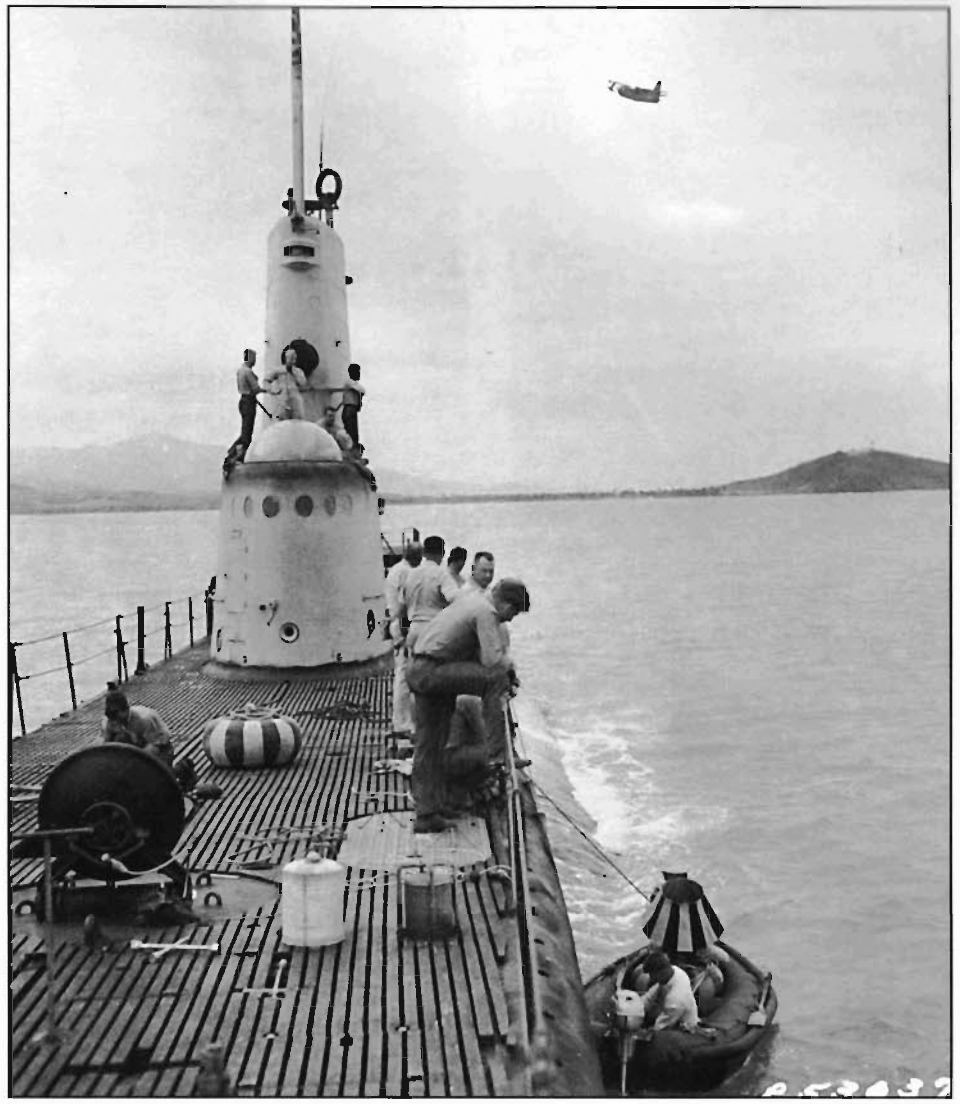
Currituck deployed to the Western Pacific for the last time to establish a seadrome at Cam Ranh Bay, South Vietnam. From there, she serviced the P5Ms of VP-40 in its missions and assignments during Operation "Market- Time." The squadron's seaplanes maintained a constant surveillance along the Vietnamese coast in search of waterborne infiltrators.

Operating from *Currituck*, VP-40 participated in the last seaplane tender operations conducted by the U.S. Navy and closed this phase of US Naval Aviation History at Cam Ranh Bay, Republic of Vietnam, after operating there from Saturday, 19 March 1967 to Tuesday, 12 April 1967. The last "Market Time" combat patrol was flown by VP-40 on Monday 11 April 1967. On Tuesday, 23 May 1967, *Currituck* returned to her home port at San Diego, CA. She was the last active seaplane tender in the US Navy. In late summer, *Currituck* sailed for the Puget Sound Naval Shipyard at Bremerton, WA, for decommissioning. *Currituck* was decommissioned 31 October 1967.

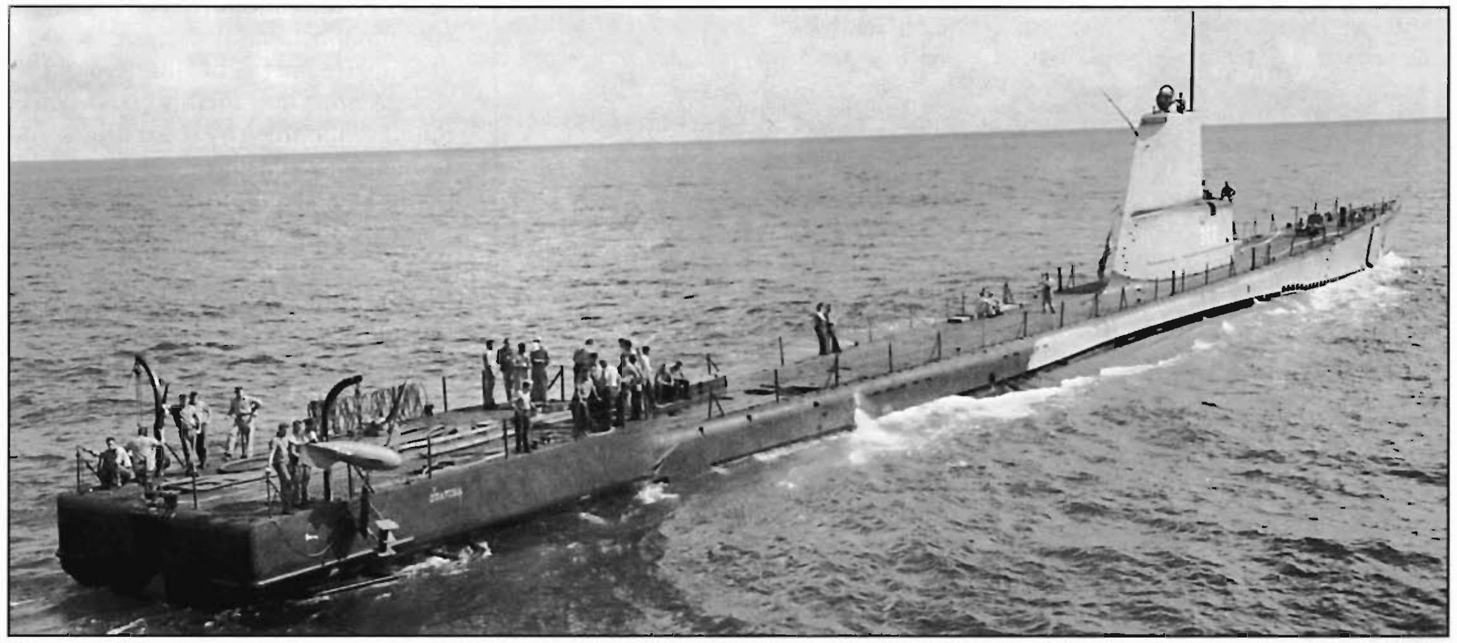
THE SEAMASTER'S SURROGATE

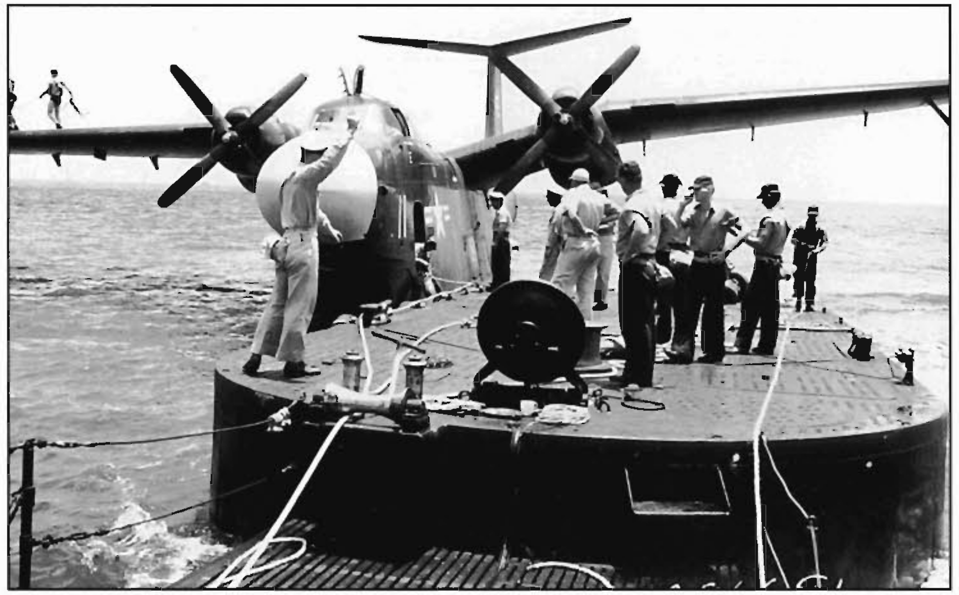
In the post-World War II period, the strategic nuclear mission was of primary importance. The U. S. Navy tried to build its own nuclear strike capability to prevent it from being overshadowed by the Air Force's Strategic Air Command. A 1949 Navy proposal to build the "super carrier" *United States* for Navy strategic bombers was not approved by the Truman Administration, so the Navy's Bureau of Aeronautics came up with another approach, the Seaplane Striking Force (SSF). The SSF envisioned a fleet of jet-powered seaplanes that would not only be capable of long-range nuclear strike, but would also be useful for conventional bombing, reconnaissance, and mining. Laying mines was seen as particularly important, since to reach the open seas most of the Soviet Navy had to pass through geographic straits that could be blocked by mining. These seaplanes would be able to operate from advanced areas, supported by seaplane tenders or even by submarines.

The Navy issued a Request for Proposal (RFP) for the aircraft industry in April 1951. The Navy requirements stated that the SSF seaplane was to carry a 30,000 pound payload to a target over 1,500 miles from the seaplane's advanced base. The aircraft was to be capable of a Mach 0.9



Above and below, USS Guavina (AGSS-362), Prototype Submarine Oiler for P6M SeaMaster in 1956. (Martin)





Above, VP-56 P5M-2 is tied-up alongside the "Flight Deck" of Guavina for refueling in 1956. (USN) Below, artist's conception of planned modifications to USS Albermarle (AV-5) in order to service the P6M SeaMaster. (USN via R. Knott)

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dash at low altitude.

Convair and Martin submitted proposals, and Martin won the competition. On 31 October 1952, the Navy awarded Martin a contract for two prototypes, with the Navy designation of XP6M-1 and the nickname of "SeaMaster". The first SeaMaster prototype was rolled out on 21 December 1954, and made its first flight on 14 July 1955.

The SeaMaster was but part of the SSF system. Also required were fixed and mobile support bases. As the aircraft was being developed, plans were being made to use existing ships as SeaMaster support vessels and to use Marlins to validate the ship's practicality.

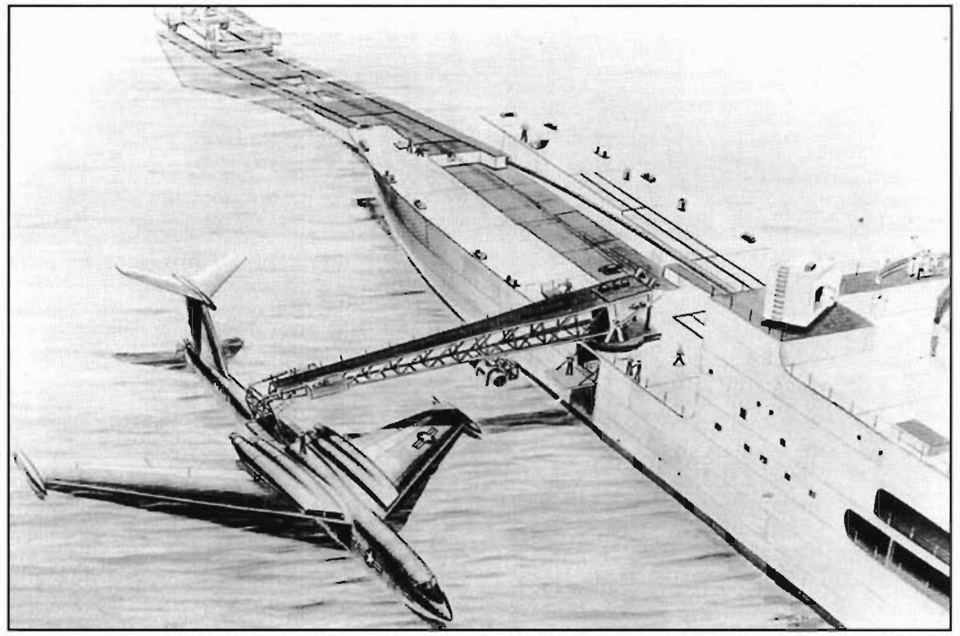
Immediately available was the submarine *Guavina* (SS-362) which had been converted in 1950 to refuel other submarines. After an overhaul in 1952, *Guavina* was re-designated a "submarine research ship" (AGSS-362) to reflect its experimental refueling mission. During another, very extensive overhaul in 1955, *Guavina* was fitted with a large, raised platform over the after torpedo room. This platform was soon dubbed the "flight deck"

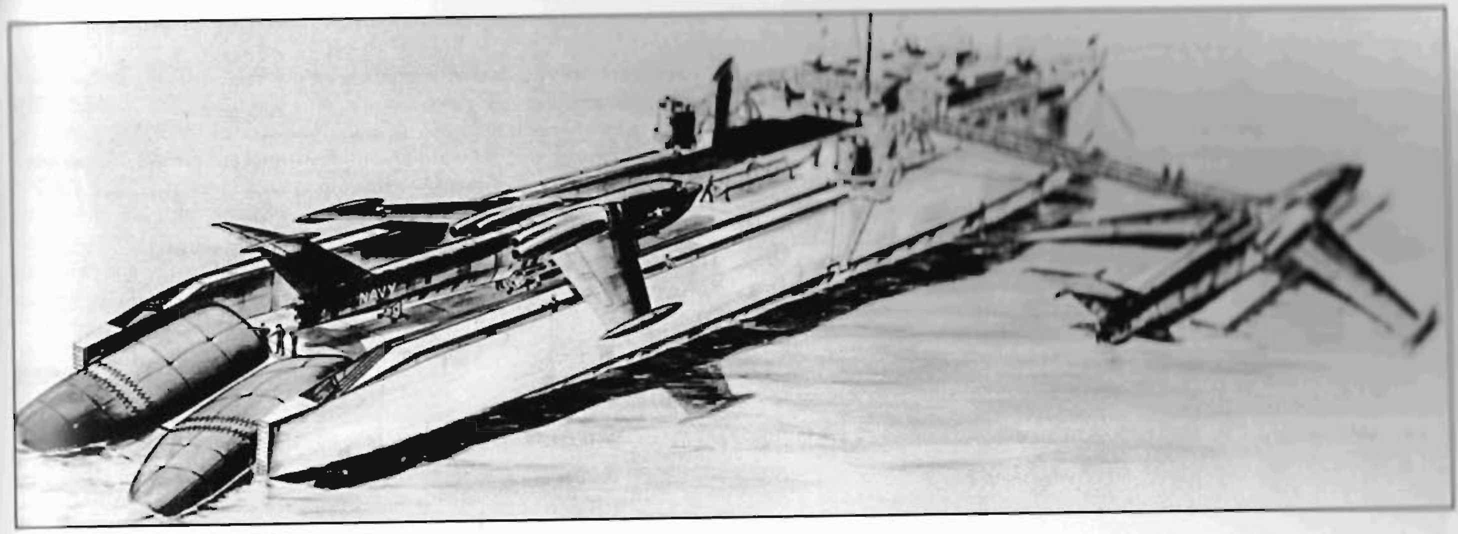
In January 1956, *Guavina* began testing the concept of mobile support of seaplanes from a submarine oiler. *Guavina* could refuel seaplanes alongside at anchor, or through a "refueling buoy" when underway and even when submerged. *Guavina* carried out refueling development for most of 1956, including a two months' deployment to the Mediterranean supporting the P5Ms of VP-56.

In 1957 *Guavina* was re-designated a "submarine oiler" (AOSS-362), and participated in Exercise Caribops 1957 where she supported P5Ms of VP-44 and VP-49. During 1957-58 GUAVINA continued to work with Marlins along the East Coast. The author recalls refueling his VX-1 Marlin from *Guavina* at Fort Jefferson in the Dry Tortugas in 1958. Although *Guavina* had demonstrated refueling seaplanes from submarines was practical and efficient, with the demise of the Seamaster program *Guavina* was put into reserve on 4 January 1959.

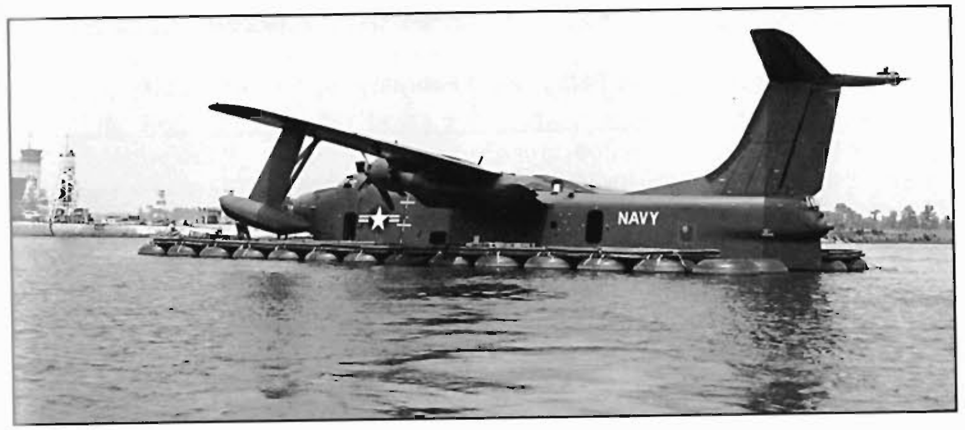
Two large seaplane tenders, *Albermarle* (AV-5) and *Currituck* (AV-7), were selected for conversion to SeaMaster support vessels, and *Albermarle* began shipyard work in 1956. Because of the weight of SeaMaster, the aircraft could not be lifted aboard by a crane so Albermarle's design featured an automated beaching ramp. The ramp had not been completed when the SeaMaster program was canceled. Work had never been started on *Currituck.*

Two landing ship docks, *Ashland* (LSD-1) and *Whitemarsh* (LSD-8), were also slated to become SeaMaster support vessels. The LSD was almost custom-made for the task. Its well deck was big enough to dock two SeaMasters or three Marlins.





Above, artist's conception of projected conversion of LPD to an AVD (Aircraft Tender Dock) for SeaMaster support. (USN via R. Knott) Below, P5M-2 testing floating rubber repair U-dock. (Martin) Bottom, USS Ashland docking VP-56 P5M-2 on 19 February 1957. (Martin)

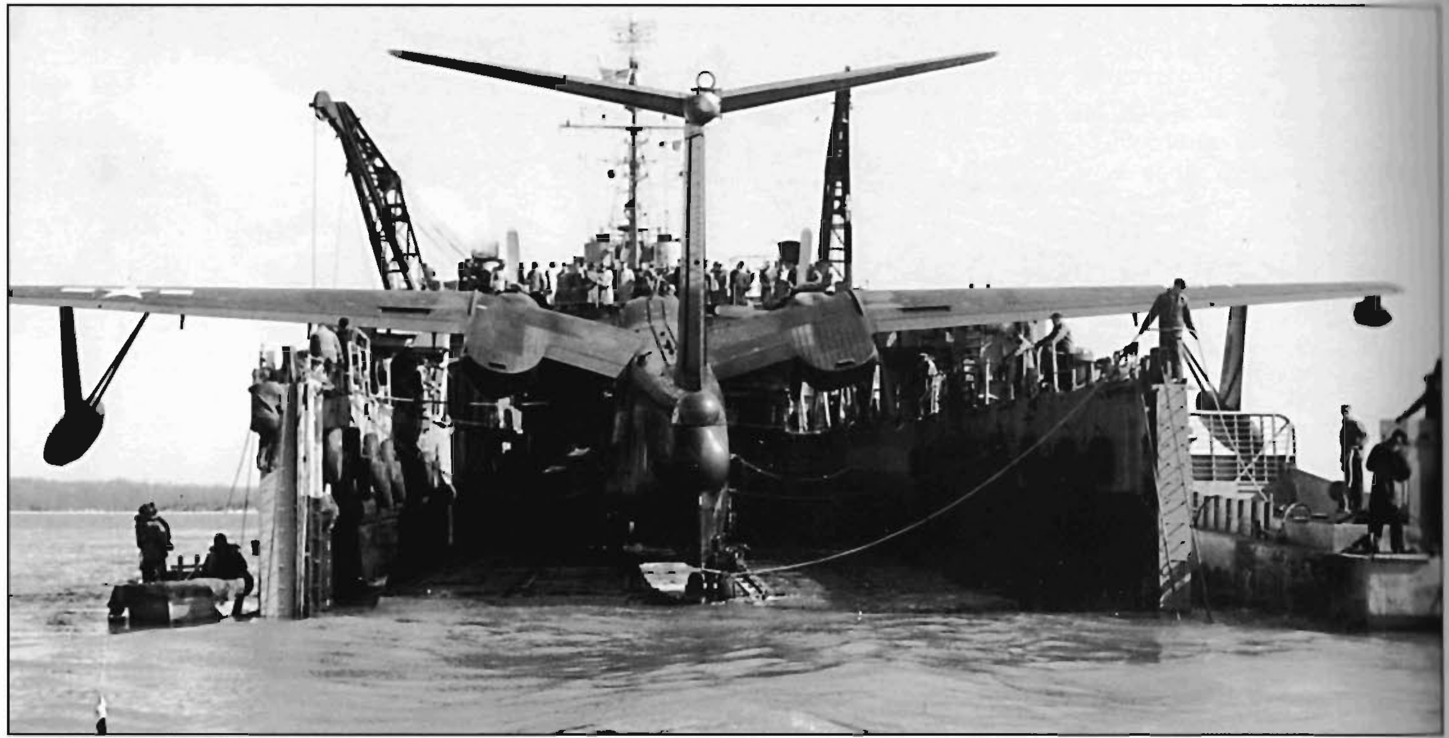


On 1 November 1956, *Ashland* was transferred to the control of Commander, Naval Air Forces, Atlantic, for SeaMaster basing experiments. On February 18, 1957, without any major ship's modifications, *Ashland* conducted seaplane recovery and launching operations in the upper Chesapeake Bay with P5M-2s of VP-56.

The Chesapeake Bay operations validated the concept of the LSD as a seaplane tender and *Ashland* was further optimized for seaplane tending by removal of its helicopter deck and by the addition of aircraft maintenance vans, a rubber U-dock and seaplane refueling buoys. Ashland was outfitted with aircraft rearming and refueling boats and could lay aircraft mooring buoys and sealane marker buoys.

Configuration changes were completed by July 1957 and the ship deployed to the Caribbean for Exercise "Caribops 1957" in August and September. Ashland established seadromes in San Juan, Fajardo, Ponce and Jobos Bay, Puerto Rico, as well as at Charlotte Amalie in the Virgin Islands to service four P5Ms of VP-49 deployed from Bermuda and two of VP-44 from Norfolk. During the exercise, the P5Ms engaged in ASW, rocket firing and mining exercises and in refueling exercises with the submarine oiler *Guavina.* Routine rearming and refueling of the aircraft was by boats from *Ashland.* At least three different P5Ms were tender-docked (tendocked) during 18 evolutions on *Ashland* for repair work. The time for docking and undocking averaged about 30 minutes. One launching was accomplished in 5 minutes.

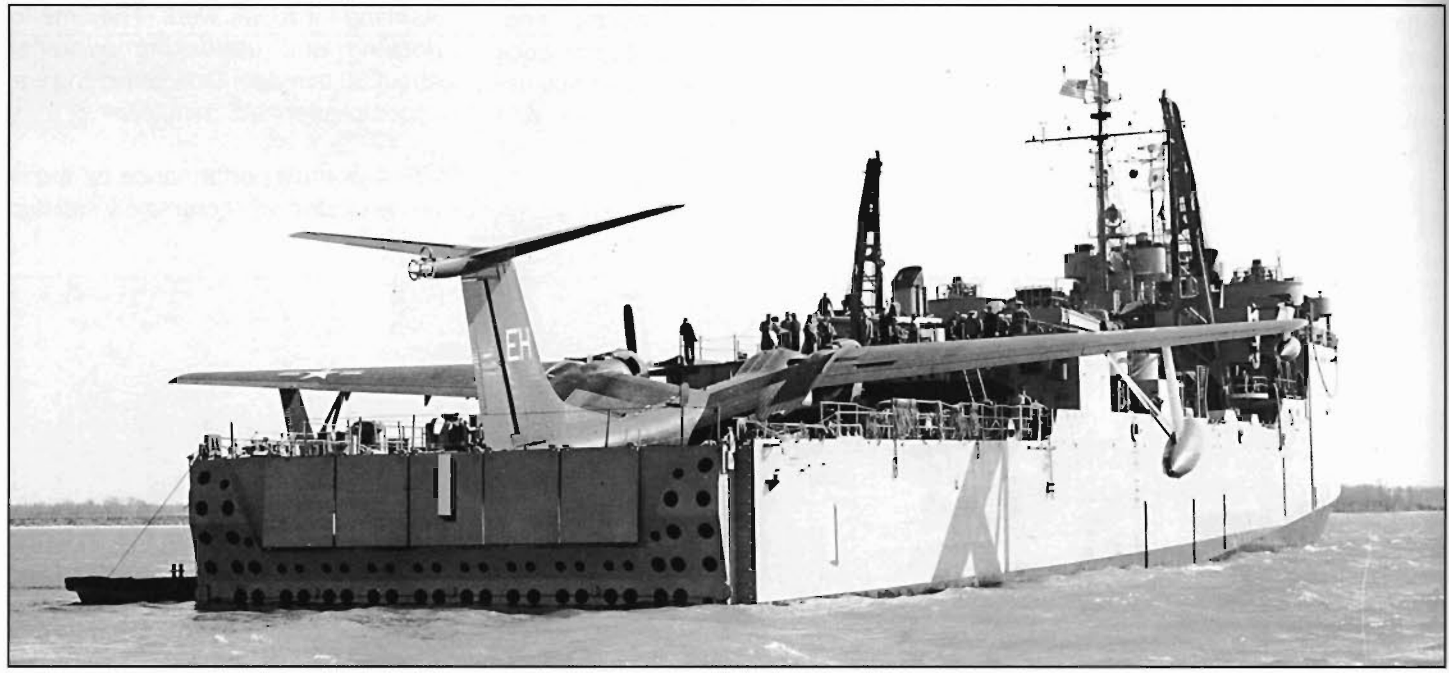
Ashland's performance as a seaplane tender was completely satisfac-



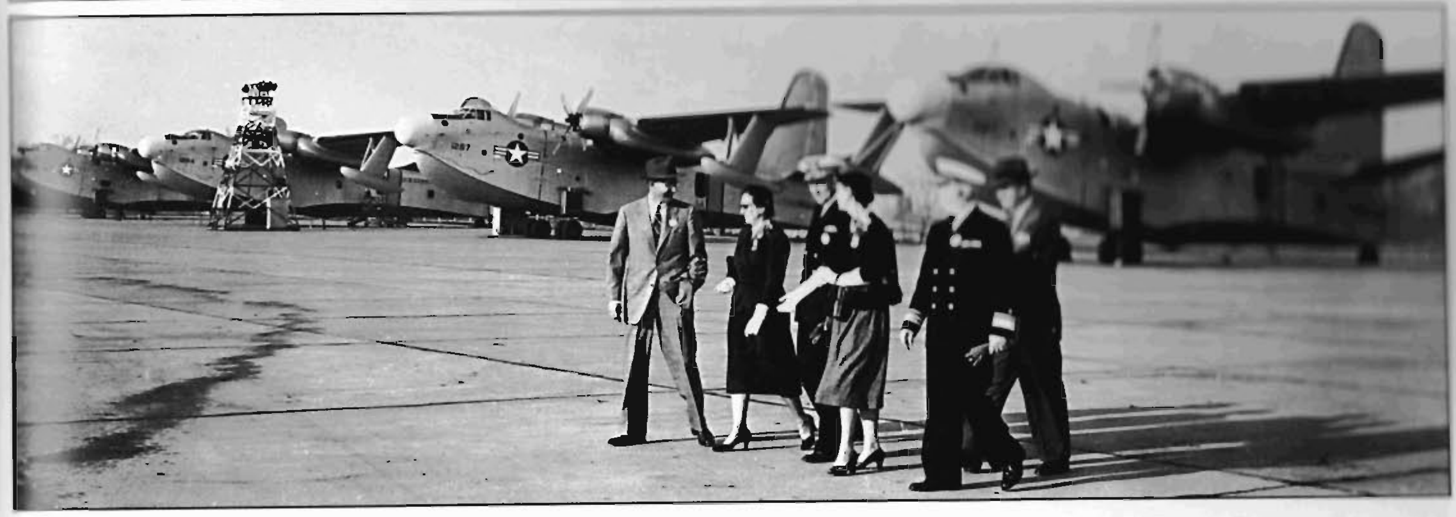
tory, however because of slippage in the SeaMaster program, *Ashland* was decommissioned on 14 September 1957 and placed in the Atlantic Reserve Fleet. *Whitemarsh* was never used to tend seaplanes.

The Marlin exercises with Guavina and Ashland had demonstrated the practicality of using submarines and LPDs for SeaMaster support, but cancellation of the SeaMaster program ended further experimentation.

USS Ashland docking VP-56 P5M-2 on 19 February 1957. (Martin/USN)



MARLINS IN THE UNITED STATES COAST GUARD



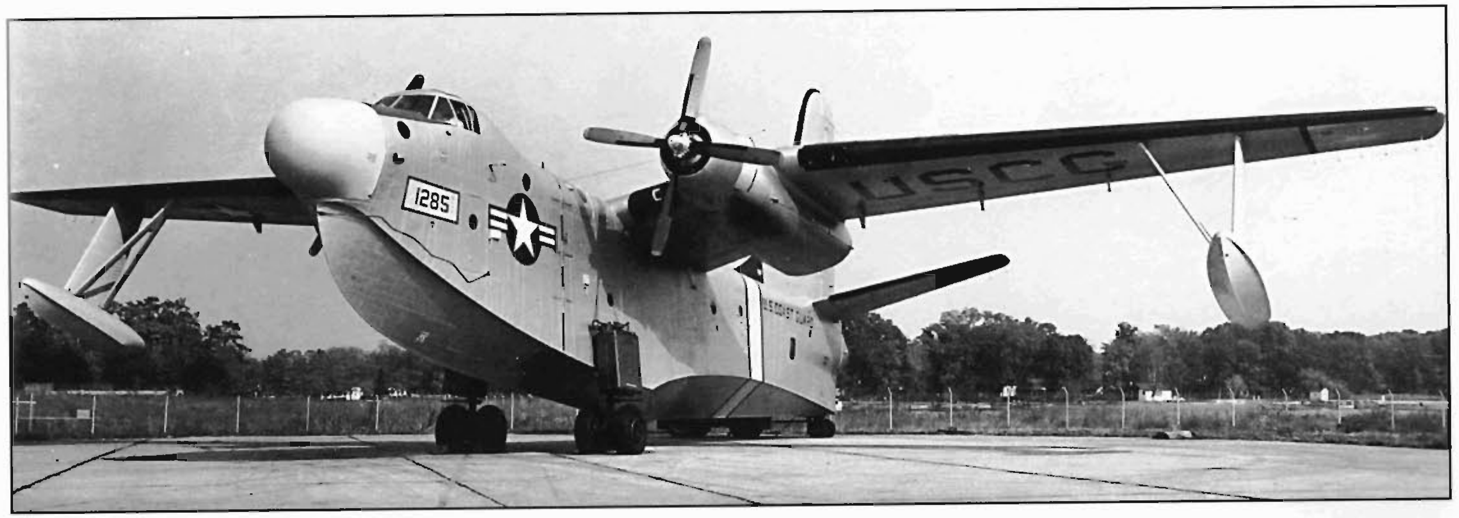
In 1931, the U.S. Coast Guard commissioned the first of its Douglas Dolphin amphibians and in 1932 it received five purpose-built General Aviation (successor to the North American Fokker Company) PJ-1 Flying Life Boat (FLB) flying boats. Almost immediately after receiving these aircraft, the Coast Guard began to earn a reputation as the world's premier aerial ocean rescue service.

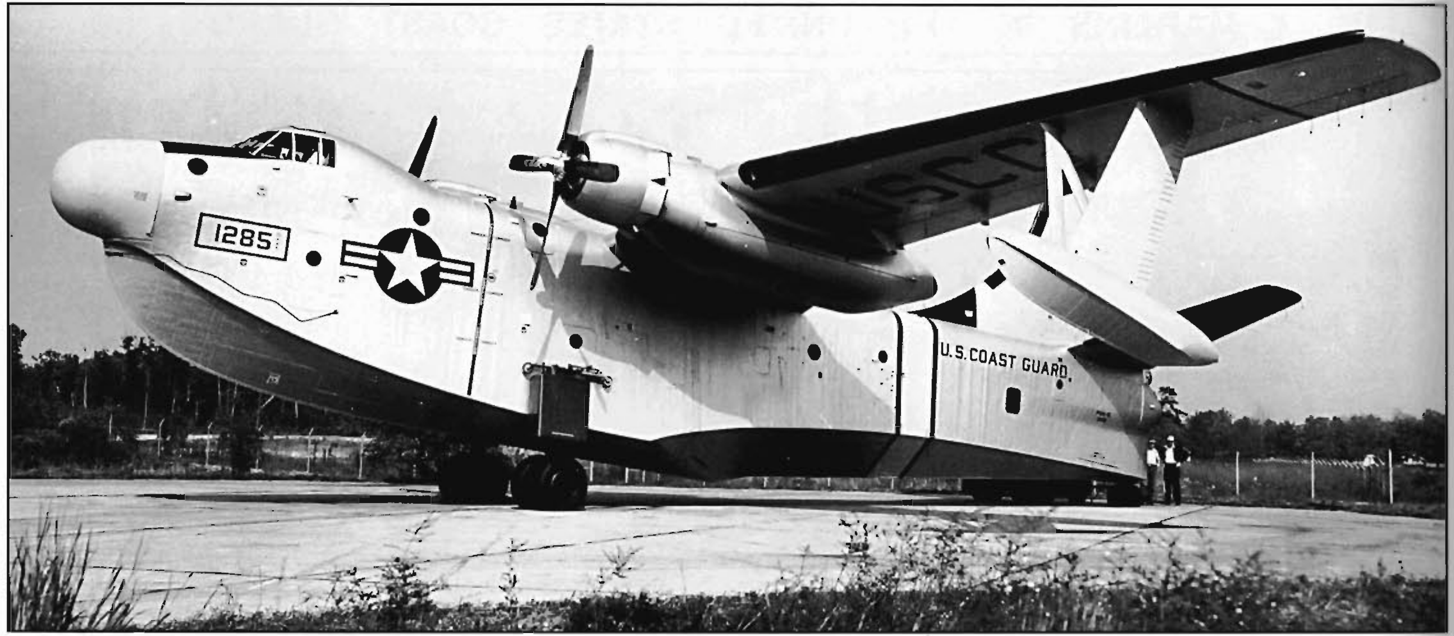
Coast Guard open-sea rescue missions became almost commonplace during the 1930s. In 1936, seven new PH-2 flying boats were ordered from the Hall Aluminum Company. Based on the design of a Navy patrol bomber, the PH-2 was optimized for the Coast Guard ocean rescue mission. This biplane flying boat had the slow landing speed and short take-off run necessary for rough sea operation. It was quite successful and seven more of an improved PH-3 type was ordered in 1938.

In World War II, the Coast Guard became part of the Navy and to its life-saving mission were added the military tasks of coastal security patrol, convoy escort and anti-submarine warfare. Consolidated PBY Catalinas and Grumman Goose and Widgeon amphibians were added to the Coast Guard inventory.

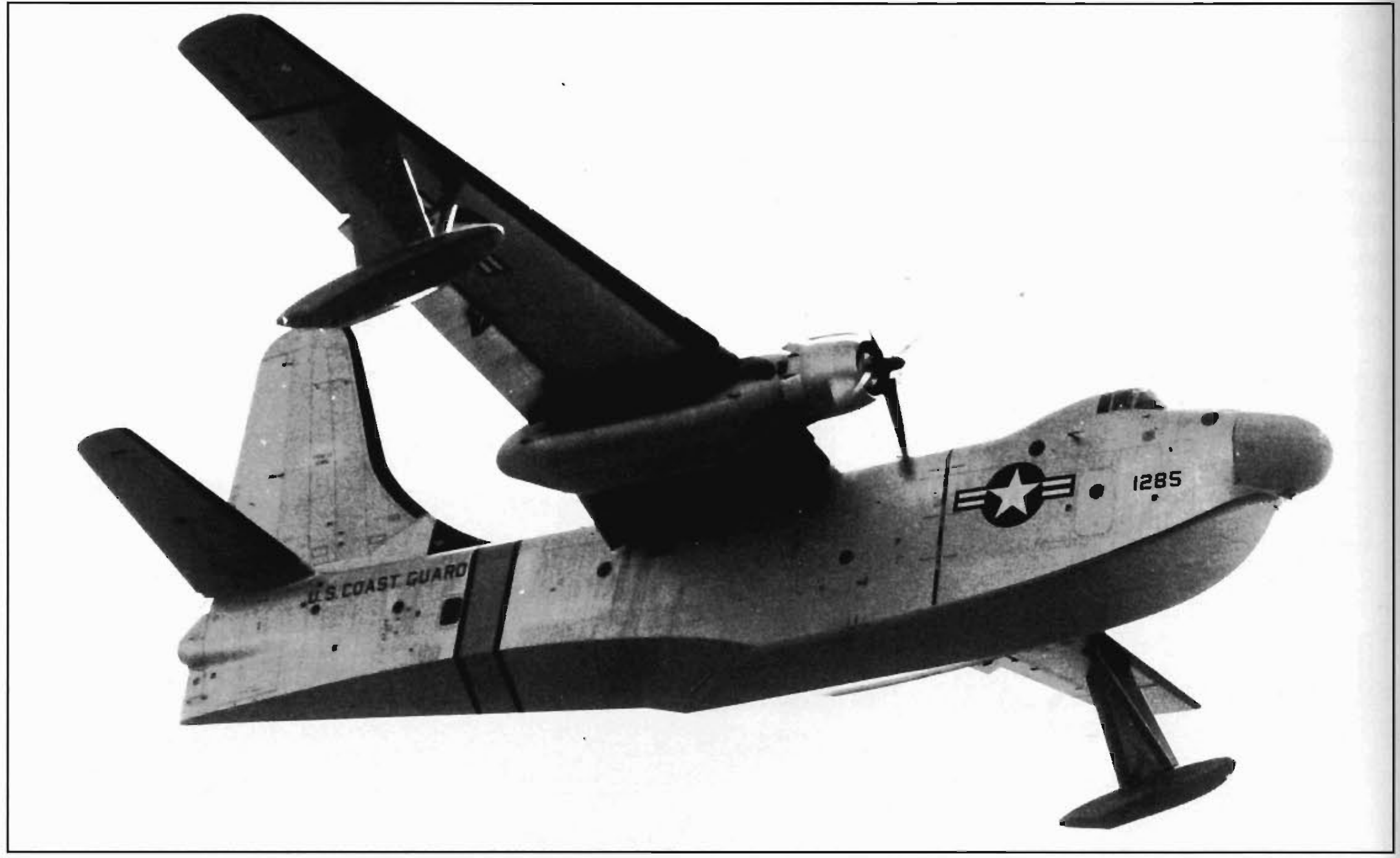
In December 1942, the Coast Guard participated in the establishment of the first United States air-sea rescue unit. The unit was organized at San Diego when the increasing number of military and naval flights in the area called for the establishment of an agency whose primary function would be that of rescuing flyers forced down at land or sea. Independent rescue activities by the Army, Navy, Marine Corps, and Coast Guard had often resulted in confusion and duplication of effort. Upon a suggestion by the Coast Guard that a single agency coordinate all efforts, the Secretary of the Navy in March 1944 established an Air-Sea Rescue Agency, headed by the Commandant of the Coast Guard. Army, Navy, Marine Corps, and Coast Guard representatives were members of this agency, which was charged with coordinating operations; conducting joint studies; recommending methods, procedures, and

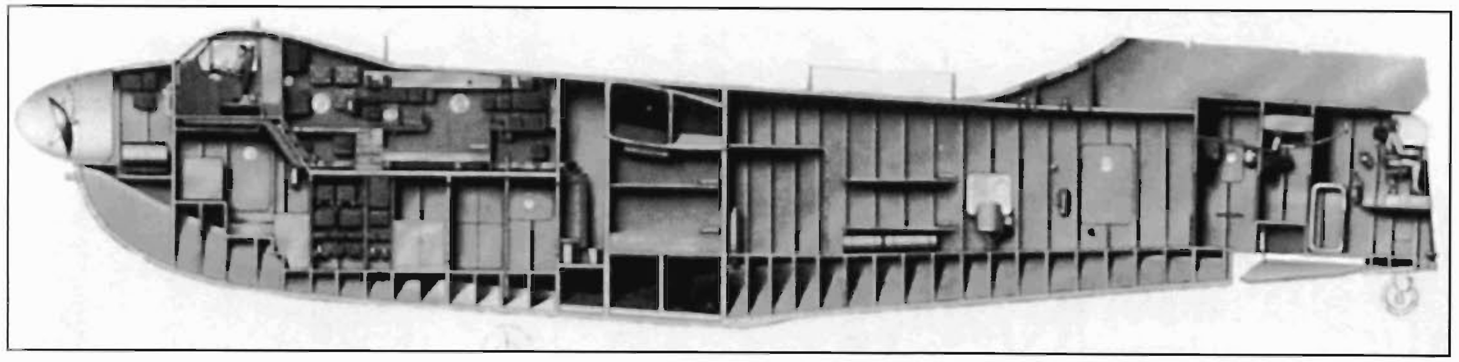
Above, P5M-1Gs lined-up for acceptance by the Coast Guard on 22 October 1953 at Martin. Serial numbers from right to left were; 1297, 1287, 1284, 1286. (Martin) Below, 1285 was the first aircraft accepted. (Martin)



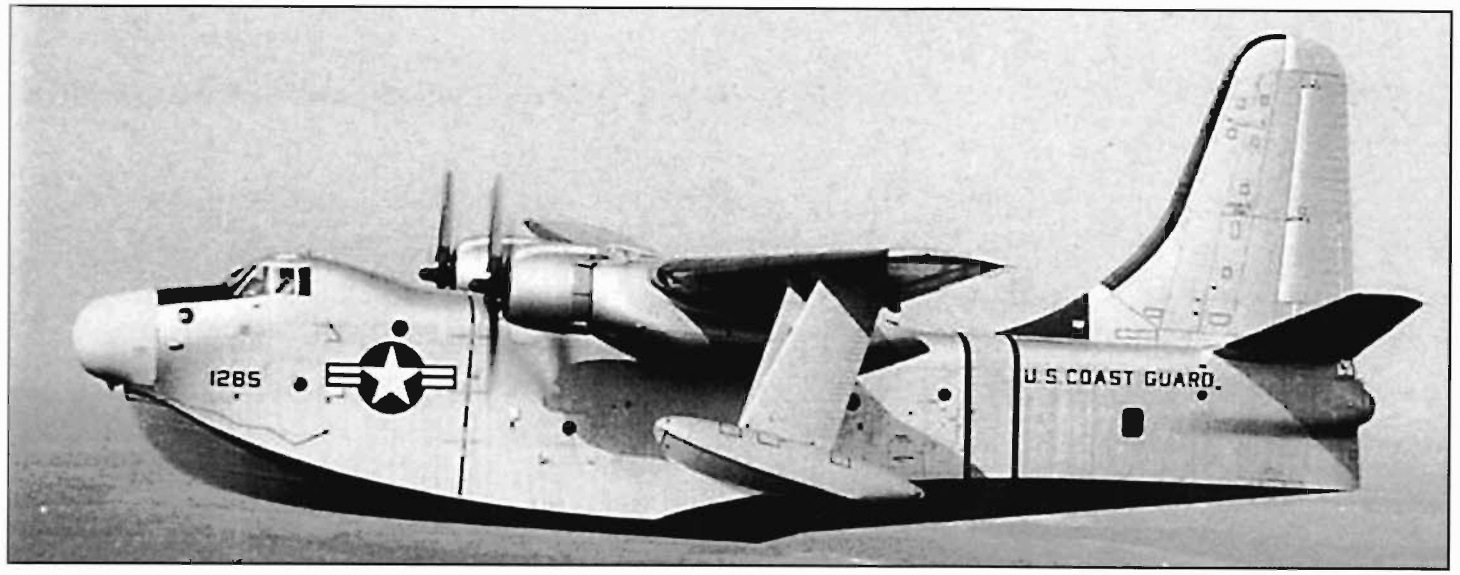


Above, side view of P5M-1G serial number 1285. (Martin) Below, USCG acceptance flight of serial number 1285 on 22 October 1953. (Martin)





Above, USCG P5M-1Gs and P5M-2Gs were ordered and built with most military equipment removed to optimize interior space for the search and rescue role. The smaller AN/APS-33 search radar was used in these versions instead of the AN/APS-44A. (Martin) Bottom, P5M-1G 1285 in 1954. Originally, the USCG Marlins were silver with yellow trim. Yellow was found on the floats, outer wing panels, rear fuselage stripe and sometimes as a background for the serial number on the bow. (USCG)



techniques; and disseminating information. By 1945 the Air-Sea Rescue Agency was responsible for 165 aircraft and nine air stations. During that year, it responded to 686 plane crashes.

Initially, the amphibious PBY-5A Catalina and high-speed "crashboats" were the rescue vehicles, but in late 1943 the Coast Guard was allocated 37 Martin PBM-3 Mariner flying boats, which were assigned to the various Coast Guard air stations. San Diego received four in December and one more in August 1944. In mid-1944, CDR Donald B. MacDiarmid became commanding officer of Coast Guard Air Station, San Diego. The combination of Martin PBMs and CDR MacDiarmid began a new era in ocean rescue. CDR MacDiarmid performed an extensive analysis of the effect of sea state on flying boat operations and developed pilot techniques to allow safe operation in the open sea.

Following World War II, the PBM-3s were returned to the Navy and the Coast Guard was assigned the more powerful and JATO-equipped PBM-5. Most of these aircraft were configured as PBM-5Gs which were optimized for rescue missions. All unnecessary weight was removed and the aircraft were fitted with reversing propellers to shorten the landing run. Flown using MacDiarmid's techniques, the PBM-5Gs made spectacular rescues at sea far outside the very limited range of the early helicopters. In the early 1950s, the flying boat seemed to be an essential element of ocean rescue.

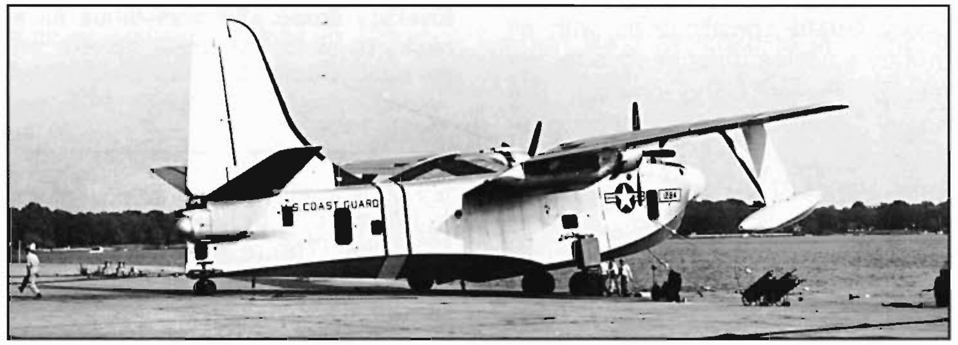
To replace its fleet of aging Mariners and Catalinas, in 1951 the Coast Guard ordered seven of the new Martin P5M-1 Marlin flying boats and seven Grumman UF-1 amphibians.

The author assumes the Coast Guard Marlin order was a direct contract because the aircraft were not assigned a navy Bureau Number. The seven Marlins were designated P5M-1G and assigned the USCG service numbers 1284 –1287 and 1295-1297. These Coast Guard Marlins were not just modifications of navy aircraft. They were specially built to Coast Guard specifications with all military equipment not needed for the rescue mission being omitted. The heavy AN/APS-44A periscope-detecting radar was replaced by a much lighter AN/APS-33.

Delivery of the first Coast Guard Marlin for evaluation was on November 20,1953. Delivery of the remaining six was in the fall of 1954. Initially, three of the P5M-1Gs were assigned to the USCG Air Station at St. Petersburg, Florida, two to Elizabeth City, North Carolina, and two to San Francisco.

In 1953, Martin developed the P5M-2 which differed from the P5M-1 by having a "T" tail and a revised bow chine line. The revised bow reduced spray into the propellers during takeoff and the "T" tail reduced the possibility of spray damage to the horizontal stabilizer in rough water operations. Four of these Marlins, designated P5M-2G, were ordered by the Coast Guard and delivery began in December 1955. The P5M-2Gs were assigned USCG Service Numbers 1312 and 1318-1320 and were initially based in San Diego and St.

Above and below, USCG P5M-1G serial number 1284 shortly after delivery in 1954. (Martin) Bottom, USCG P5M-1G serial number 1287 at San Francisco Airport on 30 July 1955. The yellow fuselage stripe was outlined in dark blue. (W.T. Larkins via Swisher)

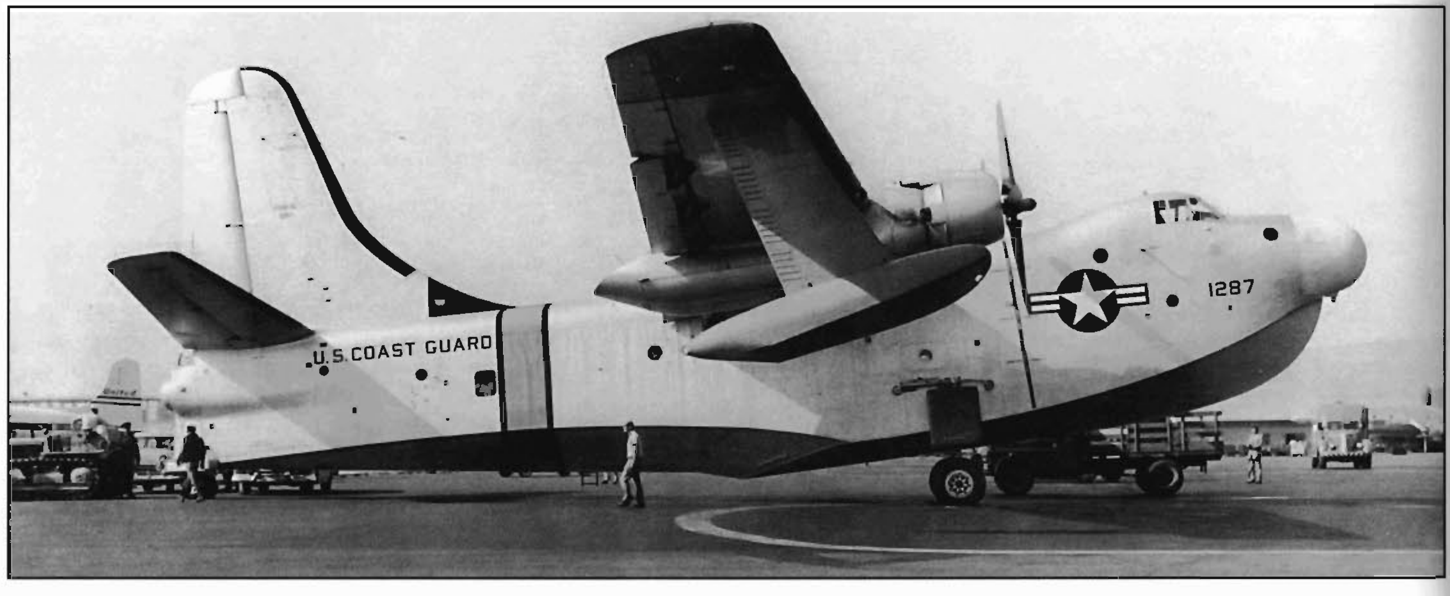


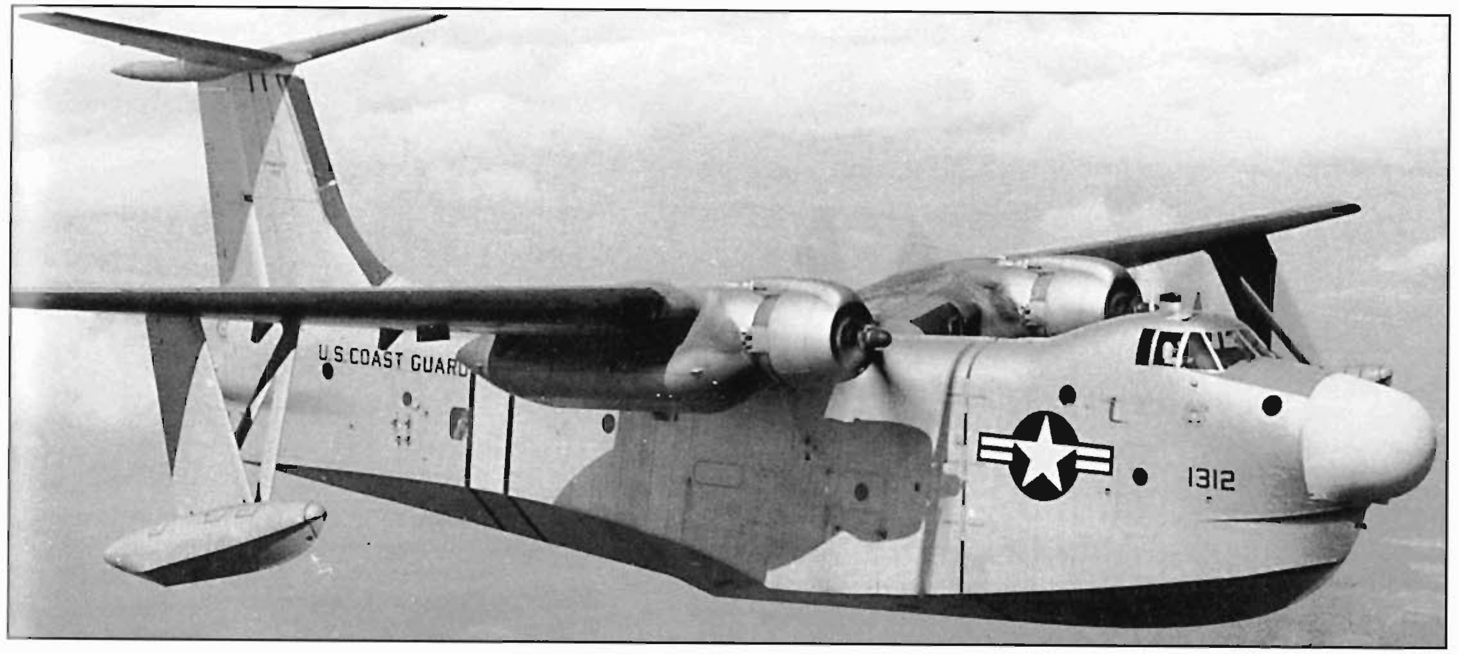
Petersburg. Later, two Marlins would be assigned to the Coast Guard Air Detachment at Bermuda.

However, by the mid-1950s, the need for off-shore seaplane landings was diminishing. The helicopter had taken over the short-range mission and in 1958 the computer-assisted Automated Merchant Vessel Emergency Reporting (AMVER) System became operational. The AMVER System allowed the Coast Guard to direct the closest surface ship of any nationality to the scene of an emergency.

Since 14 Mariners had been lost or damaged beyond repair in off-shore operations, in the Marlin era permission for off-shore landings had to be given from shore headquarters, and permission was given only when no other vehicle could perform the rescue. As Admiral Robbins stated: "Landing off-shore was iffy business, at best. Banged up aircraft often led to having more people in the water to be rescued than in the beginning of a mission."

There were, however, still a number of Marlin off-shore rescue missions. Clyde Hensley recalls that he was plane captain on a Marlin rescue mission flown by CDR Flanagan out of St. Petersburg. The Marlin made an open-sea landing about half-way between St. Petersburg and Houston to pick up an ill seaman from a Norwegian freighter. Transfer of the patient was made by a hulking lifeboat from the freighter with a real threat of the Marlin being rammed by the lifeboat! After a twilight JATO take-off, the Marlin brought the patient to St. Petersburg. After all of that, Clyde says he heard the patient died because no one would sign him into the hospital!





Above, USCG P5M-2G serial number 1312 in flight in 1956. (USCG)

The Coast Guard Historian's website states: "1957 5 July: A P5M Martin seaplane from the U.S. Coast Guard Air Station, San Francisco made an offshore landing at the extreme operating range of 950 miles southwest of San Francisco to remove a seriously ill seaman, who had been transferred from the merchant vessel *Kirribilli* to the USS *George*."

David Oliver, in *"Flying Boats and Amphibians Since 1945"*, when discussing Marlin operations from St. Petersburg, wrote: "On one occasion, four seamen were rescued by a USCG Marlin no less than 1,150 miles (1,850 km) out at sea."

The late Capt John Waters in *"Rescue at Sea"* has an undated photo captioned "A Coast Guard P5M fighting to get into the air in rough seas 300 miles off Florida. The smoke from the JATO bottles can be seen, and just astern of the plane is the disturbed water where it hit on the last bounce before getting airborne. Two seamen, badly burned, have just been evacuated from a fishing vessel."

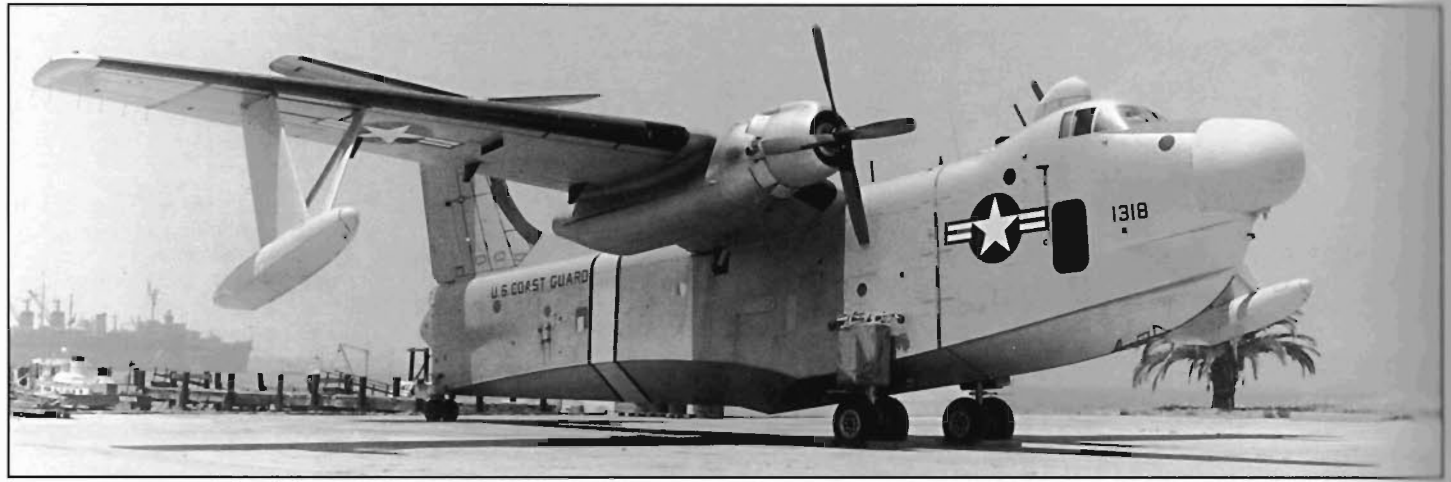
Bernard A. Hoyland's reminisces *"Bernie Air Stories"* include: "It was 7 Nov 1958, and we were enroute in P5M-2G 1318 from CGAS San Diego to medically air evacuate an injured fisherman from a fishing vessel in the lee of the Soccoro Island. The Pilot in Command was LCDR Jack Tooley, and LT Bill Claborn and I shared copilot and navigator duties. We found the fishing vessel with no trouble because the island is a big radar target. In those days, navigation in that part of the world was dead reckoning on a chart with a little help from homing on the vessel's radio transmissions and from radar. We did a sea evaluation at the vessel's location and didn't like what we saw so we prudently circled the island looking for a better lee and more protected water.

"The vessel was in fact at the site of the most protected water. We did another high and low sea evaluation, picked our landing course, dragged the P5M in with full flaps and enough power to just clear the water. Jack saw a 'smoother' spot (smoother is only in the eye of the beholder), closed the throttles and reversed the props in mid-air and we landed, eventfully. *There are no uneventful open sea landings.*

"We got the patient onboard and loaded four JATO bottles (loading JATO bottles in a seaway is no picnic), I'm guessing that we weighed about 70,000 pounds at take-off. We got established on a take-off heading, set full power, fired the bottles and flew home, making a night landing in the seadrome. It was all in a very long day's work, about 12.7 hours of flying time."

Bob Mercier remembers: "I flew the P5M as a nugget in 56-58 while stationed at Elizabeth City, North Carolina. I was along as co-pilot on an off-shore landing. Must have been in '58. LCDR Norm Miley was the PPC. It was rough as a cob. The aircraft number was 1312."

CDR Paul Lamb, USCG (Ret) added another: "While I was stationed at Coast Guard Air Detachment Bermuda, flying P5Ms, I specifically remember one offshore rescue mission. CDR Fletcher Brown was the pilot and LCDR Robert Lemmon was the co-pilot. It occurred sometime



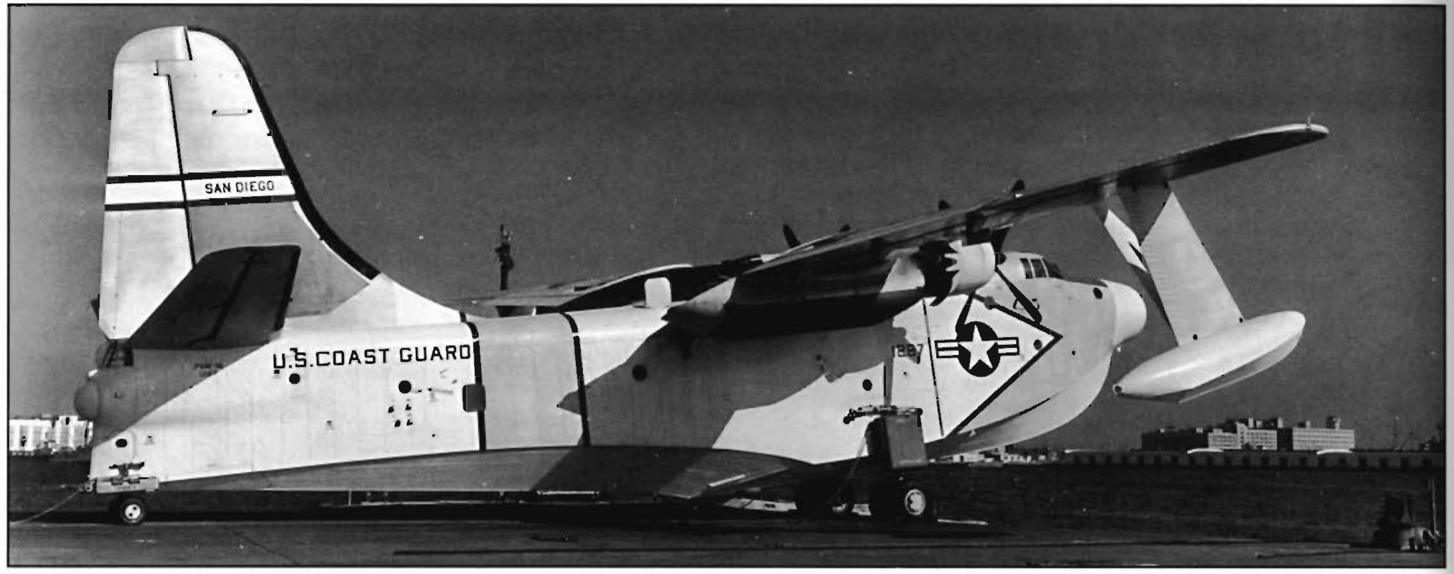
Above, P5M-2G serial number 1318 at Coast Guard Air Station San Diego. (Clay Jansson via Swisher) Below, P5M-1G serial number 1287 at CGAS San Diego on 29 August 1959 in the final paint scheme used on Coast Guard Marlins. Aircraft was overall white with extensive da-glo orange trim (horizontal stabilizers, rudder, upper half of vertical stabilizer, wide fuselage band, forward fuselage, outer wings, and float pylons) with the lower half of the vertical fin being grey. Bomb bay doors were dark grey and the upper wing center section was black. (William Swisher)

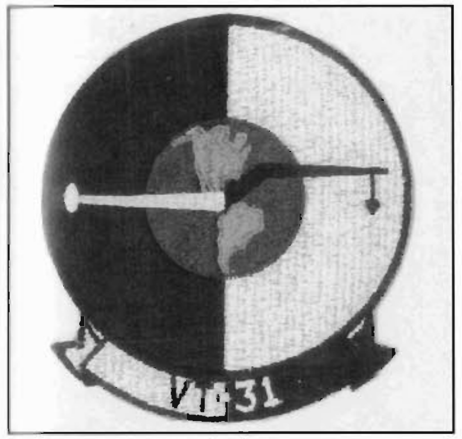
between July 1958 and December 1960. I was a Lt(jg) at the time."

R.C. Rescola recalls: "I was crewman on an off-shore out of Bermuda when we landed and put a doctor and corpsman on a ship. I think one of the pilots was C.C. Hobdy and the other (now deceased) R.A. Lemmon. Some of the other crew names I recall were Jack Turk, ordnanceman and Marvin Johnson, mechanic. During takeoff one JATO failed after ignition and we struck a wave sideways and nearly destroyed the aircraft taking out five frames. I do remember the aircraft went to the boneyard in San Diego as too busted up to fix or too expensive. Very exiting day as we trailed a raft with me in it to put the people into the ship's whaleboat. Immediately after they left the raft it turned upside down and dumped me into the water (about 6 ft seas). I don't remember the exact date but it was sometime in 1959."

But Marlin off-shore missions were relatively few. As Captain Waters summed up the situation: "By 1959 the number of open sea landings had diminished to the point where the use of the big Marlins no longer justified their expense."

The Coast Guard transferred all eleven of its Marlins to the Navy between May and December 1960. The Navy assigned the ex-USCG P5M-1Gs the BuNos 149825-149831 and the P5M-2Gs the BuNos 149832-149835. Because the Coast Guard aircraft were not equipped for fleet use, they were redesignated as P5M-1Ts and P5M-2Ts (the "T" standing for "Training"). Surviving records indicate former CG aircraft 1297, 1296, 1285, 1295, 1318 and 1319 were assigned to Training Squadron 31 (VT-31) in Corpus Christi, TX, for use in pilot training. They served in VT-31 until Marlin training ended on 20 June 1963. CG serial 1312 was assigned to VP replacement training squadron 31 (VP-31) in San Diego where it served until the Marlin was retired in 1967. No record of the Navy employment of CG Serials 1284, 1286, 1287 and 1320 could be found.

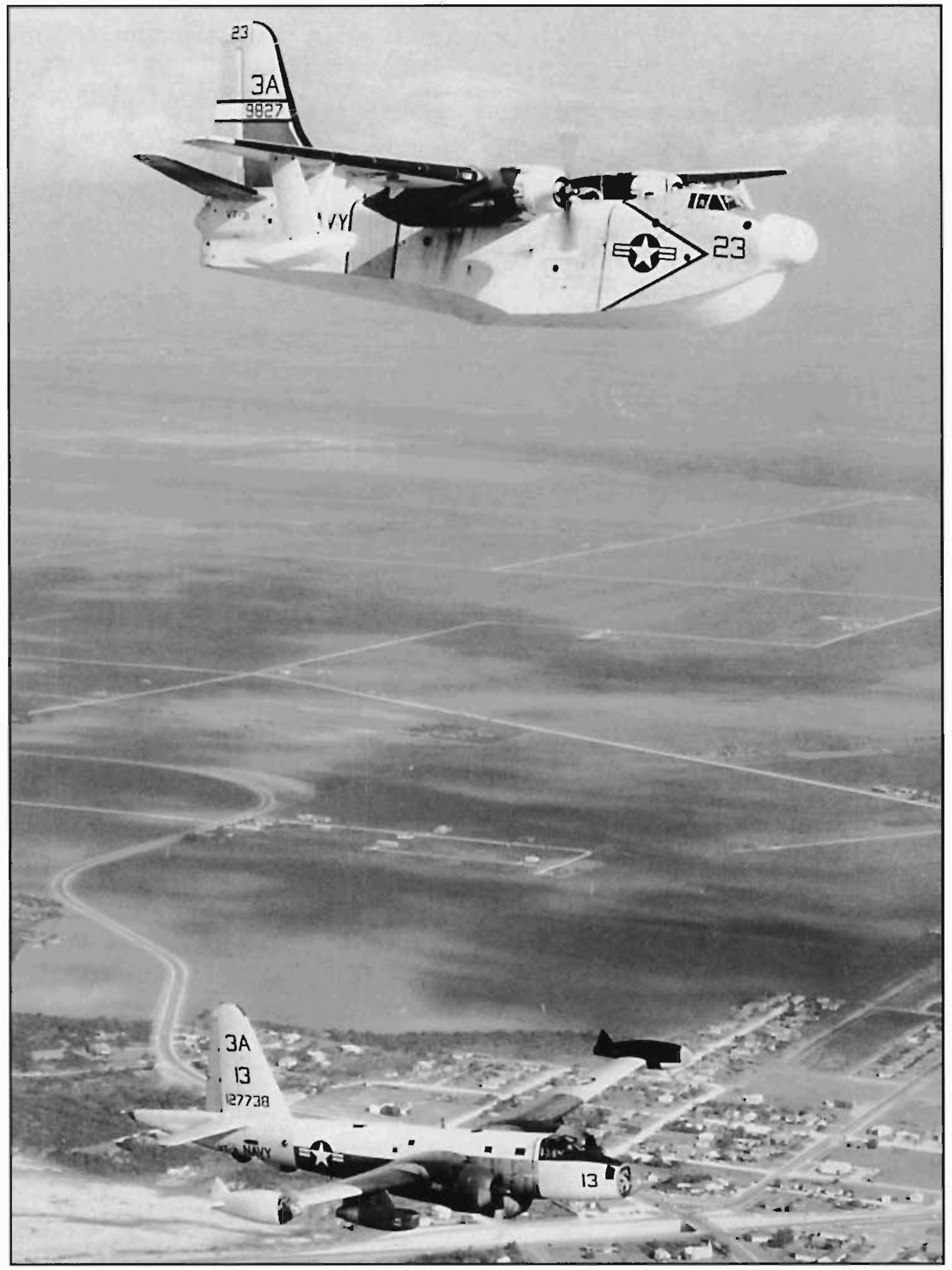




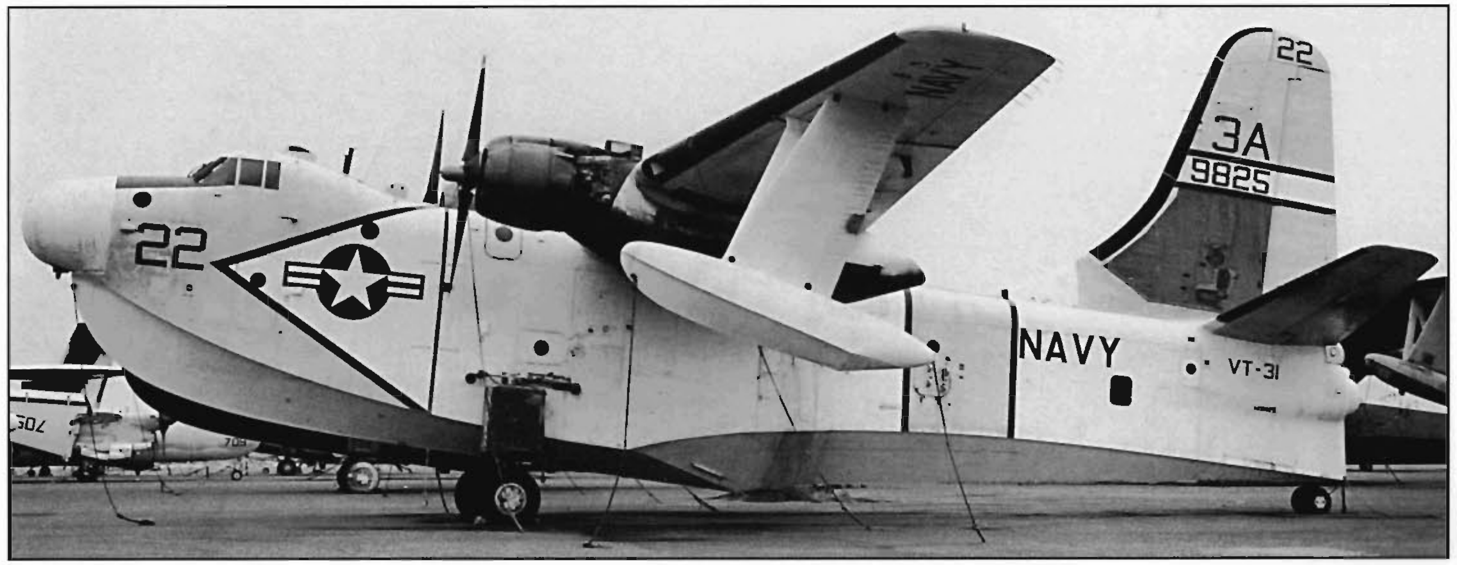
TRAINING COMMAND P5M MARLINS

PBM-equipped ATU-3 was redesignated ATU-10 in January 1947, then ATU-700 in October 1952 and then ATU-501 in the summer of 1955. In mid-1958, the first P5Ms were received to augment the squadron's complement of P2Vs and PBMs. By late 1959 the PBMs and P5Ms were retired from the training command.

ATU-601 with SNBs, TV-2s and T-34s was redesignated VT-31 in May 1960. In late 1960, the P2V arrived to replace the SNBs followed by the first of seven P5Ms received from the USCG in May 1961. In May 1963, VT-31 transitioned to TS-2A Trackers, and by June the P5Ms were gone from the Training Command.



At right, VT-31 ex-Coast Guard P5M-1T BuNo 149827 in flight with VT-31 P2V Neptune BuNo 127738 near Corpus Christi, TX. (USN) Below, ex-Coast Guard P-5A BuNo 149825 assigned to VT-31 at NAS North Island, CA, on 12 June 1965. (William Swisher)

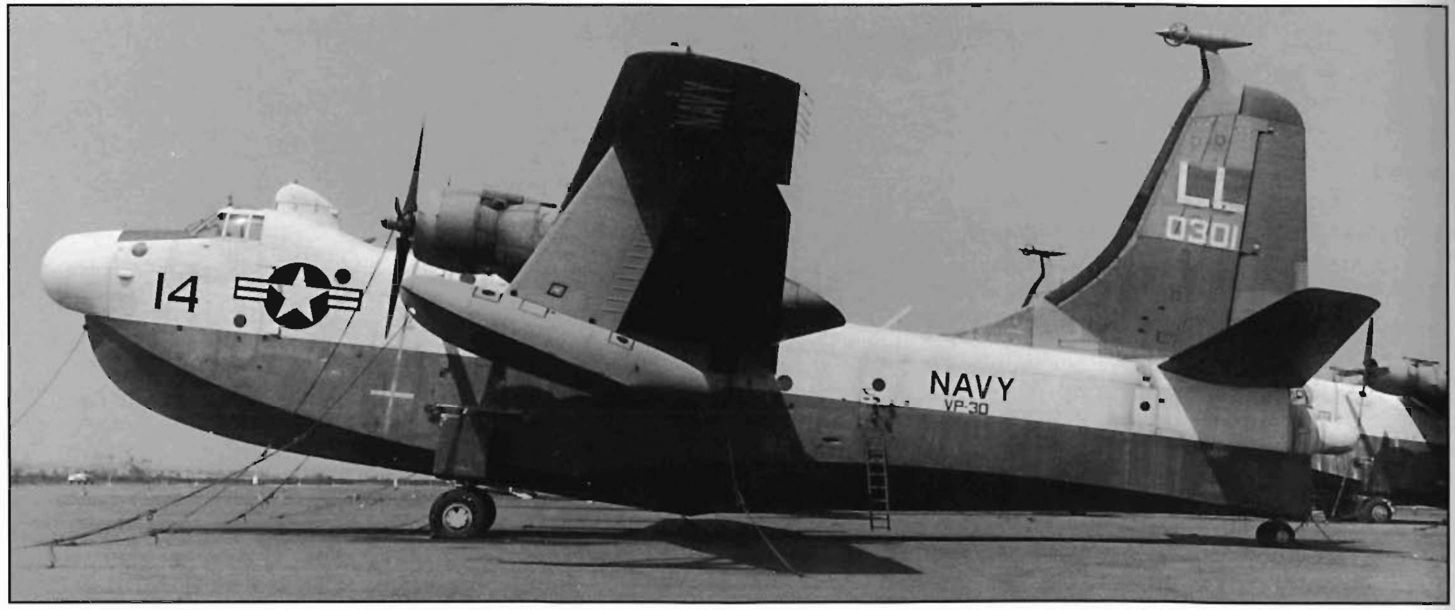


COMBAT REPLACEMENT TRAINING SQUADRONS VP-30 AND VP-31

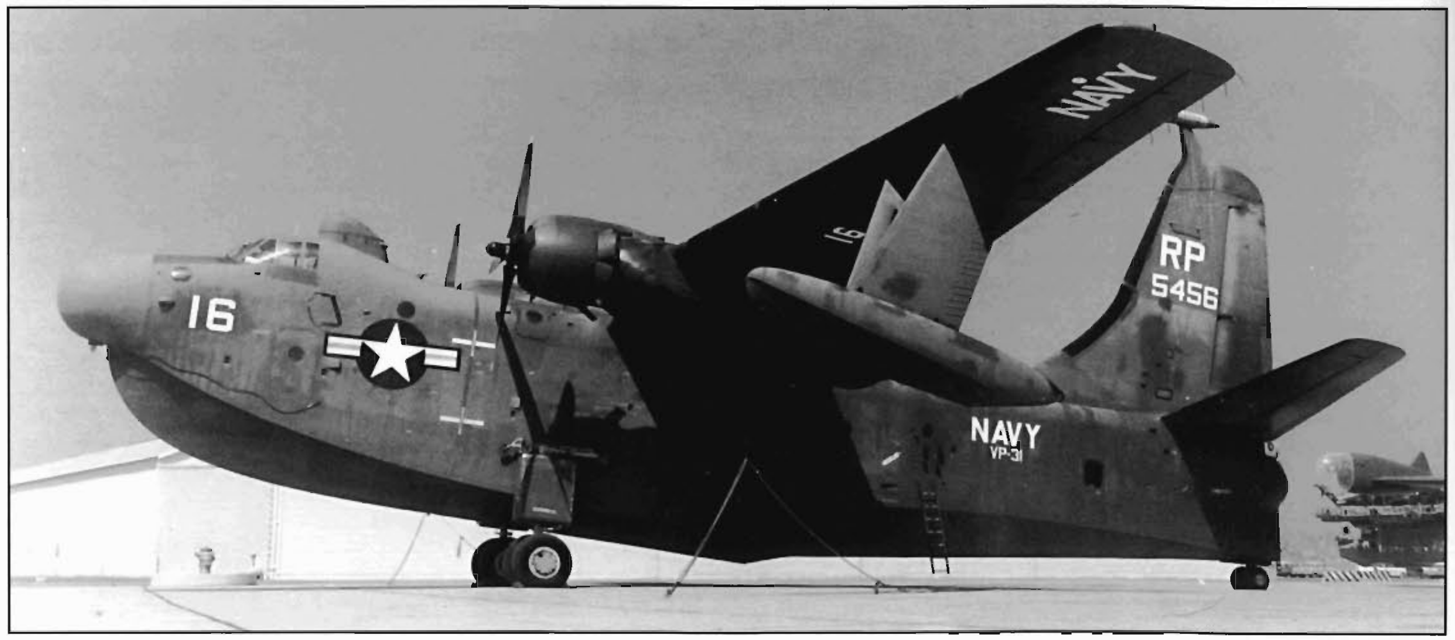
PATROL SQUADRON THIRTY

Combat Replacement Patrol Squadron VP-30 (Atlantic) and VP-31 (Pacific) were established on 30 June 1960. VP-30 was assigned to NAS Jacksonville, FL, and VP-31 was assigned to NAS North Island, CA. VP-30 had two Marlins and provided one aircraft for Det A at NAS Norfolk, VA, in 1960. VP-31, which operated up to six Marlins, took over for VP-30 at Det A Norfolk in 1961. AIRLANT Marlin operations ended in 1963 including those at VP-30. VP-31 continued as the Marlin RAG until the Marlin was retired.

PATROL SQUADRON THIRTY-ONE



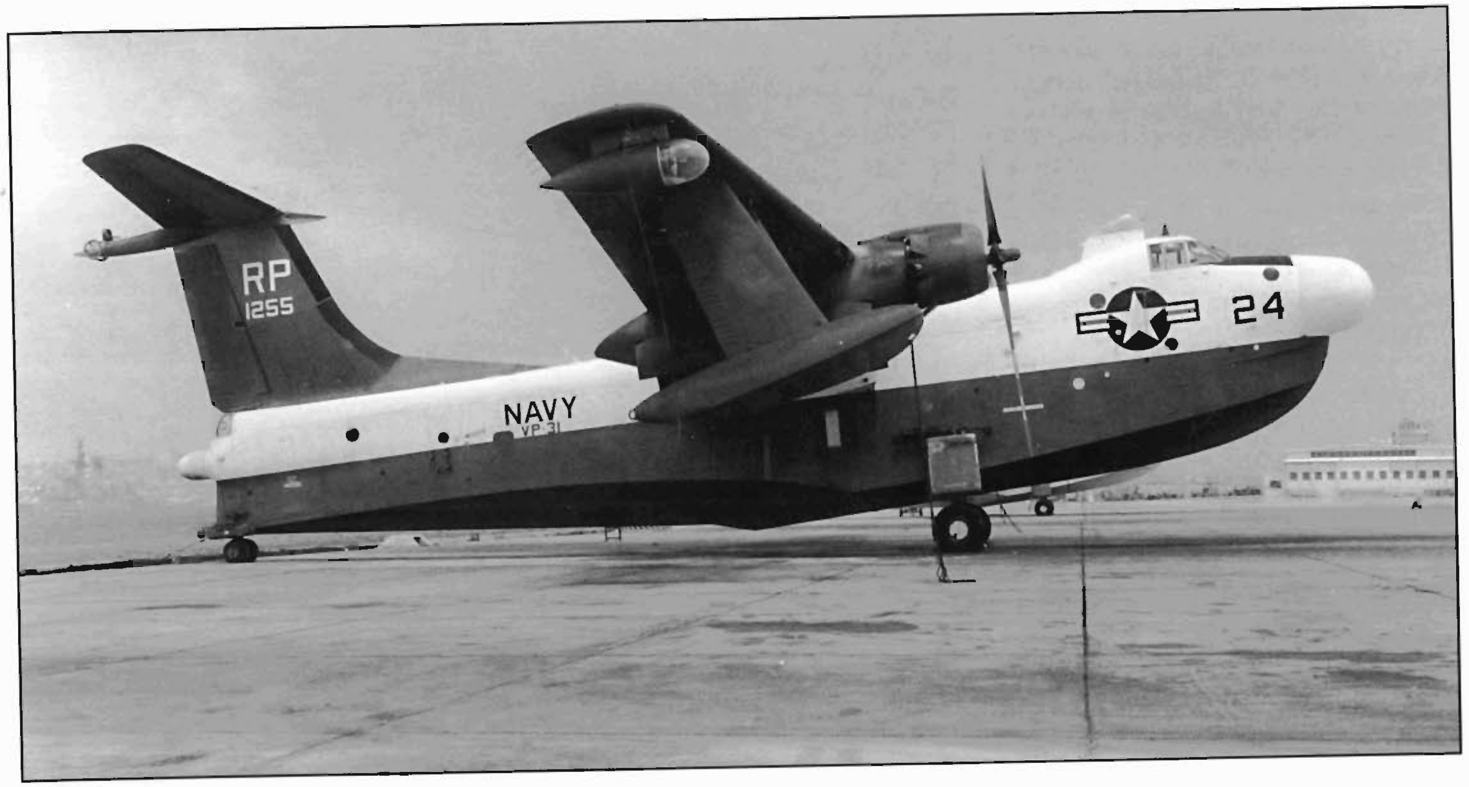
Above, VP-30 P5M-1 BuNo 130301 at NAS North Island, CA, on 25 August 1962. (William Swisher) Below, VP-31 P5M-1 BuNo 135456 at NAS North Island, CA, on 20 August 1961. (William Swisher)



VP-31 established Det A at NAS Moffett Field, CA, to train land-based patrol/ASW crews in the P2V/P-2H Neptune and, starting in January 1963, in the P-3A Orion. When the Marlin retired, VP-31 moved to Moffett Field and Det A was disestablished in February 1967.

While flying the Marlin, VP-31 trained more than 1,300 pilots, 400 NFOs, and 6,700 aircrew and maintenance personnel. The squadron also received the CNO annual Aviation Safety Award in 1964.

Above, future P5M ASW crewmen undergoing flight crew training in a VP-31 Marlin with the navigator in the foreground. (USN) Below, VP-31 SP-5B BuNo 141255 at NAS North Island, CA, on 12 June 1965. (William Swisher)



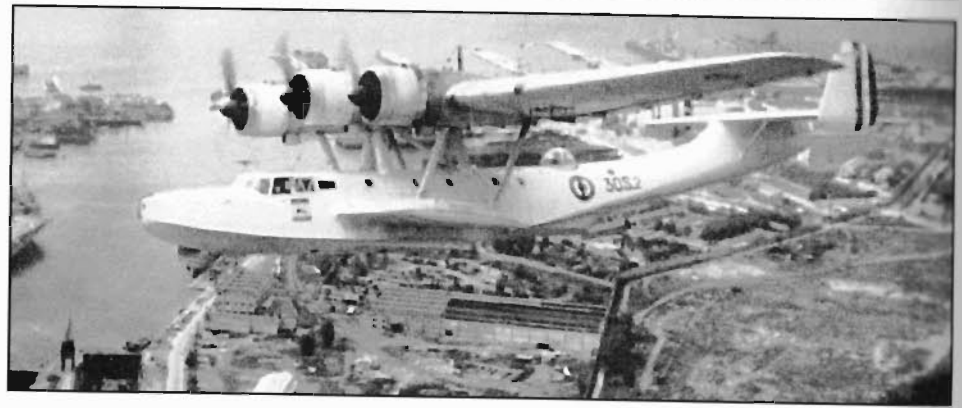
MARLINS IN THE AÉRONAVALE FRANCAISE

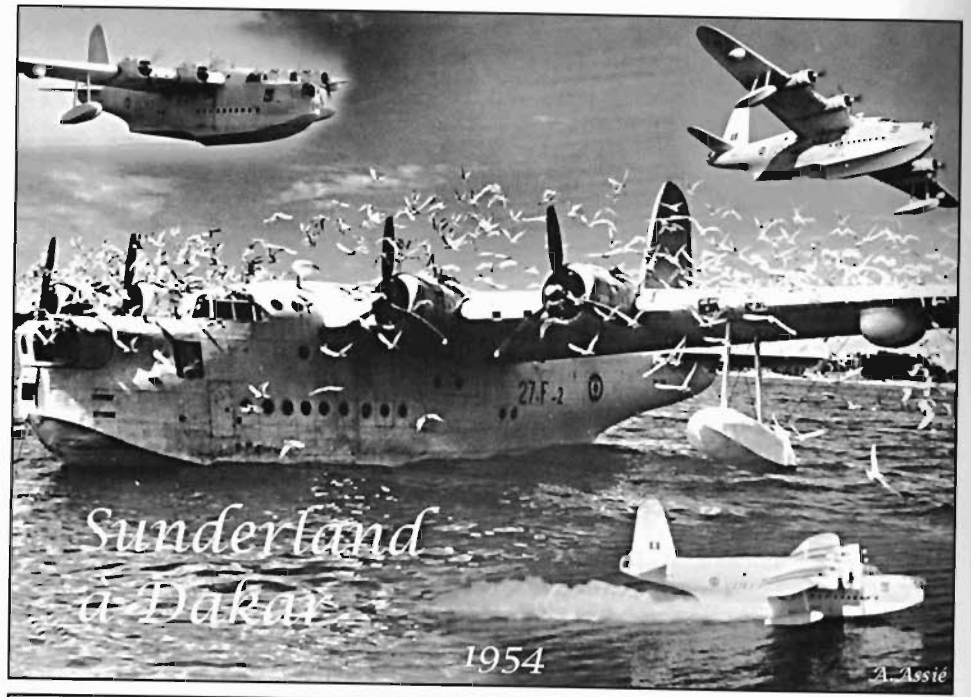
Since the first flight of an aircraft from the water by France's Henri Fabre in 1910, France had been a leader in flying boat development and operations. In WWI, hundreds of small French flying boats were active in anti-U-boat patrol along the Atlantic coast of France and were among the first aircraft operated by the United States Navy.

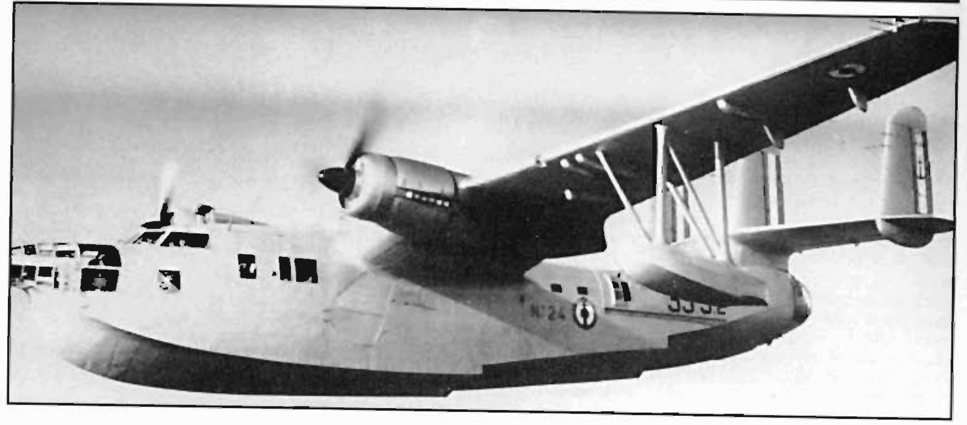
In the 1920s and 1930s, French flying boats pioneered passenger service in the Mediterranean and from France to the North African coast. In 1930, the "French Lindbergh" Jean Mermoz, pioneered the Aéropostale mail route between Dakar in West Africa to Natal in South America using a Latecoere 28 floatplane. In 1935, the six-engined Latecoere 521 *Lieutenant de Vaisseau Paris* crossed the Atlantic to visit the United States.

WWII effectively stopped French flying boat development and production. During the war, Free French naval air forces operated American PBY Catalina and British Short Sunderland MKIII flying boats. After VE Day, France continued to operate the Catalinas and Sunderlands as well as French-built Dornier DO-24 flying boats. In 1949, the Western Union Committee decided to reinforce the French Naval Air Service (Aéronavale) with Sunderland MKVs to replace the older MKIIIs. Nineteen aircraft were transferred to France in 1951 and 4 more in 1957. The MKVs came from Royal Air Force and Norwegian Navy stocks and were reconditioned by the Short Company in Belfast.

Aéronavale Squadron 7F (redesignated Squadron 27F in 1953) based in Dakar, West Africa, received 10 of the newer Sunderlands, the others were first stored at Berre near Marseille to replace those in Dakar that were lost or required overhaul. The Aéronavale had foreseen the need to replace all of its pre-war designs and in 1947 had directed the Societe Nationale de Construction du Nord (SNCAN) to design a large amphibian flying boat, the Noroit 1400/1401/1402 (four digit series number indicates type of engine installed). The Noroit first flew in 1949 but its development was plagued by problems and it was withdrawn from service by 1955.







Above, French-built Dornier Do-24 flying boat over Toulon in 1951. (Pierre Margeridon) Below, postcard montage of French Sunderlands at Dakar in 1954. (CDR F. Assié, FN Ret.) Bottom, abortive SNCAN Noroit 1402 Amphibian in 1954. (ECPA via David Oliver)

By 1958 the sturdy Sunderlands were wearing out and their antisubmarine warfare (ASW) equipment was obsolete. Since no French flying boats were available to replace the Sunderland, the Aéronavale was forced to look abroad. Under the Military Defense Assistance Program (MDAP), France arranged for the loan/lease of 10 Martin P5M-2 Marlins from the United States. The first of these was formally transferred on 9 January 1959, at a ceremony at the Martin factory in Baltimore where it was accepted by the French Naval Attaché, Admiral Poncet, and "christened" by Madame Poncet. As the Marlins (BuNos 146440 to 146445 and 147539 to 147542) came off the production line, they were flown to the Naval Air Station, Norfolk, VA, Overhaul and Repair (O&R) facility to await delivery to their French crews.

27F Squadron (In the French squadron designation systems, the suffix "F" stood for "flotille" and indicated an operational squadron. Training and transport squadrons used the suffix "S" for "service") was designated to replace its Sunderlands with Marlins, and four crews of eight were formed to ferry the Marlins from Norfolk to Dakar. Each crew consisted of an officer pilot-in-command, a co-pilot, 2 navigators, 2 mechanics, a radioman and an ordnanceman. These ferry crews were carefully selected so as to be a cadre of experienced personnel to train the rest of the squadron upon the arrival of the Marlins in Dakar. In addition to the flight crews, two flight engineer officers were named to the group.

The plan was for each crew to make at least two of the ferry trips with a planned routing from Norfolk to Guantanamo Bay, Cuba, to Trinidad, British West Indies, to Belem, Brazil, to Natal, Brazil, and then across the South Atlantic to Dakar. Training for the crews would be given by the U.S. Navy: in the aircraft at Advanced Training Unit 501 (ATU-501) in Corpus Christi, TX, and in the weapons systems at the Fleet Airborne Electronics Training Unit, Atlantic (FAETULANT) in Norfolk, VA.

The U.S. Navy had sent ahead complete technical data and manuals for the aircraft. Of course, this information was in English and the French crews spent at least two hours a day studying English and translating the documents. The French Navy also called up some reservists who were Air France navigators to train the crews in the new sextants used by the Marlins.

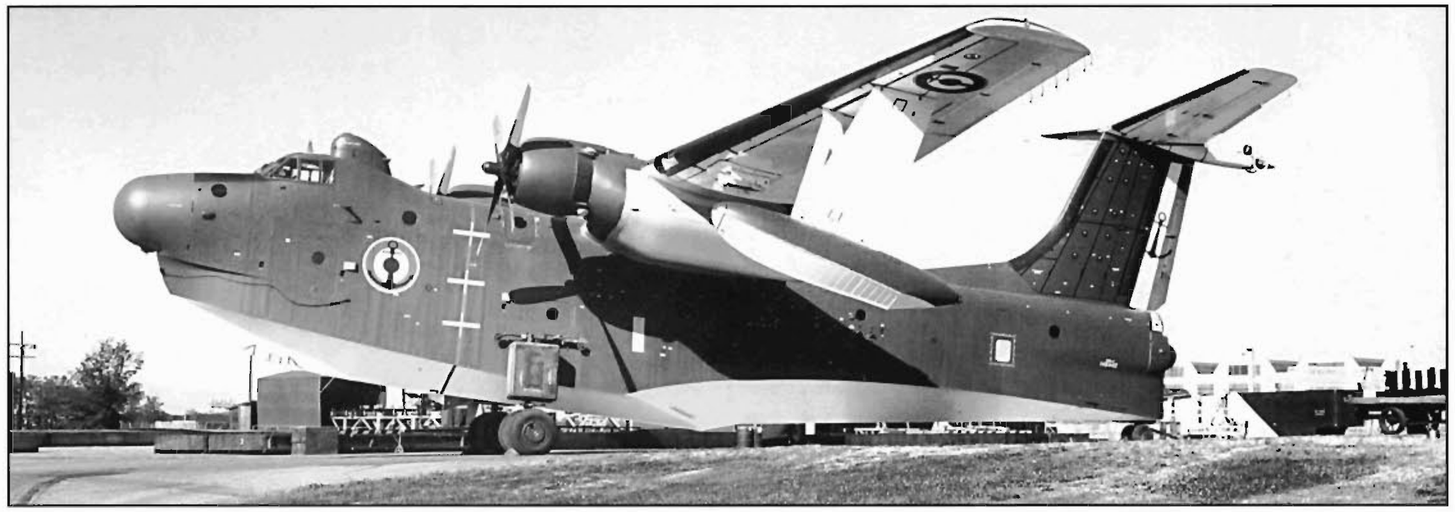
Pierre Margeridon, a petty officer second class pilot, was selected to be co-pilot to the squadron executive officer, LT Froget. Margeridon had received U.S. Navy flight training in Pensacola and Hutchison, KS, and was designated as an interpreter. His fascinating memoir, *"Les Convoyages de Marlin, 1959"* has provided much of the information for this chapter of Marlin history. The French crews departed from Dakar on 10 February 1959, and flew via Oran to Paris by military aircraft. After briefings and leave in Paris, on the 26th of February the crews boarded an Air France flight to New York via Shannon, Ireland, Gander, Newfoundland, and Boston.

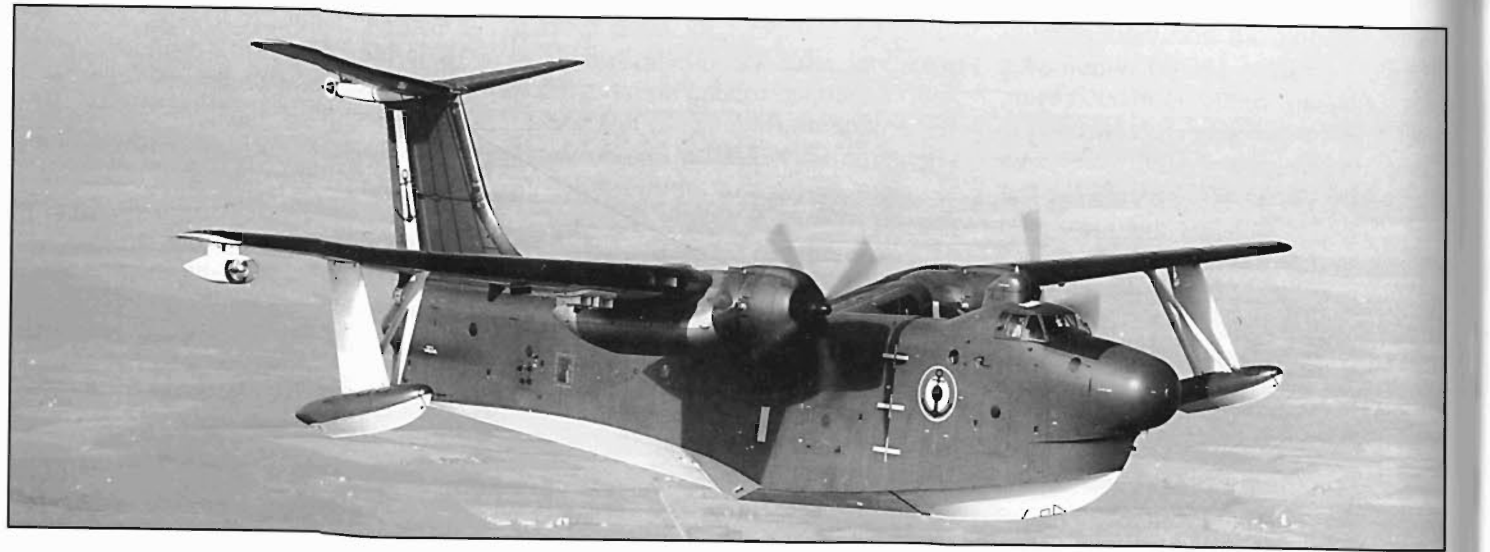
In New York the crews were berthed at the unofficial "New York Navy Headquarters", the St. George Hotel in Brooklyn. After a couple of days for sightseeing, The French crews were carried by U.S. Navy bus to La Guardia Airport for a charter flight to Corpus Christi. The French Embassy had chartered an old Curtiss C-46 Commando, flown by "three old pilots". Despite some financial problem when refueling in Nashville, Tennessee, the C-46 got them to Corpus safely.

At ATU-501, the French crews were teamed with four U.S. instructors: pilot, flight engineer, radioman and ordnanceman for specific Marlin instruction. After two familiarization flights in the Marlin the French navigators and radarmen received additional equipment-specific instruction and practice in Douglas R4Ds which were specially configured for electronics training. The French crews spent the first week in ground school studying aircraft systems and handling techniques.

On 6 March 1959, Margeridon's

Below, the first French Marlin BuNo 146440. Aircraft were delivered in a greenish-gray finish with white control surfaces and under surfaces. (Martin 1958)





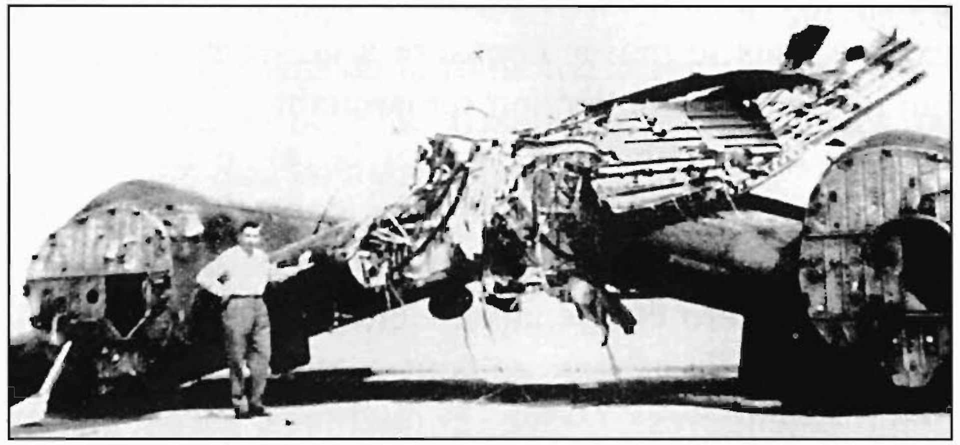
Above and below, French Marlin in delivery scheme in flight near Baltimore. (Martin)

crew began flying the Marlin. The pilots were quite pleased with the Marlin's aerodynamic and hydrodynamic qualities. Its modern hull design allowed for smooth landings and take-offs. Reversing propellers and hydroflaps permitted precise and easy maneuvering on the water. The aircraft was very stable and its power-boosted controls made flying easy.

The French pilots had plenty of flying boat experience and flying instruction proceeded smoothly. Things were going so smoothly that both French and American crewmen did not man their "ditching stations' during the landing practice.

On 12 March 1959, Margeridon's crew was on their seventh training flight, using P5M-1 BuNo 130288. The purpose of the flight was to practice rough-water landings. After LT Froget made 6 or 7 landings, PO Margeridon manned the left seat and made one landing. On his second approach, he was being instructed in the "reversing in the air" technique advocated at the time. In this technique, the pilot was to place the propellers in reverse pitch about two seconds before touchdown, the concept being that the aircraft would lose speed rapidly, resulting in a minimum run-out. However, in this procedure, when the aircraft contacted the water, it still had significant forward motion and the resultant hydrodynamic lift on the hull tended to throw the aircraft back into the air in a nose-high stalled condition. Unless the pilot quickly applied down-elevator, the aircraft would violently fall into the water with significant impact force.

As instructed, Margeridon put the props in reverse about two seconds before the estimated touchdown. After contacting the water, the aircraft was thrown out with the props still in full reverse. The aircraft made two more contacts and the last bounce was "very high". Lt. Donald J. Childers, USN, the instructor pilot, took control of the throttles so that Mageridon could use both hands on the yoke to get the nose down. On the final impact, the aircraft broke into three pieces and sank in about 12 feet of water. All crew members survived the crash. Seriously injured was U.S. aviation ordnanceman Gilbert A.York, who suffered a broken thigh. A U.S. radioman was also injured. All the crewmen were supported by life jackets and York and the radioman were placed in a self-inflated life raft.



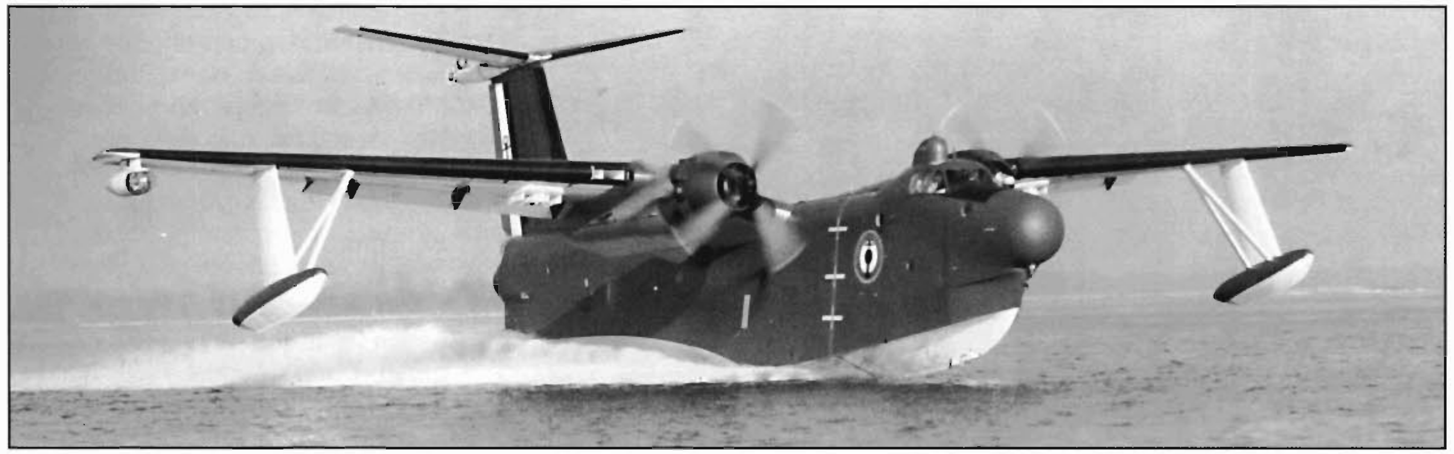
Above, French crewman Mt Condom posing with wreckage of P5M-1 BuNo 130288. Crashed in Corpus Christi, TX, during training flight for French students, on 12 March 1959. (Pierre Margeridon) Below, pre-delivery take-off run of a French Marlin. (Martin)

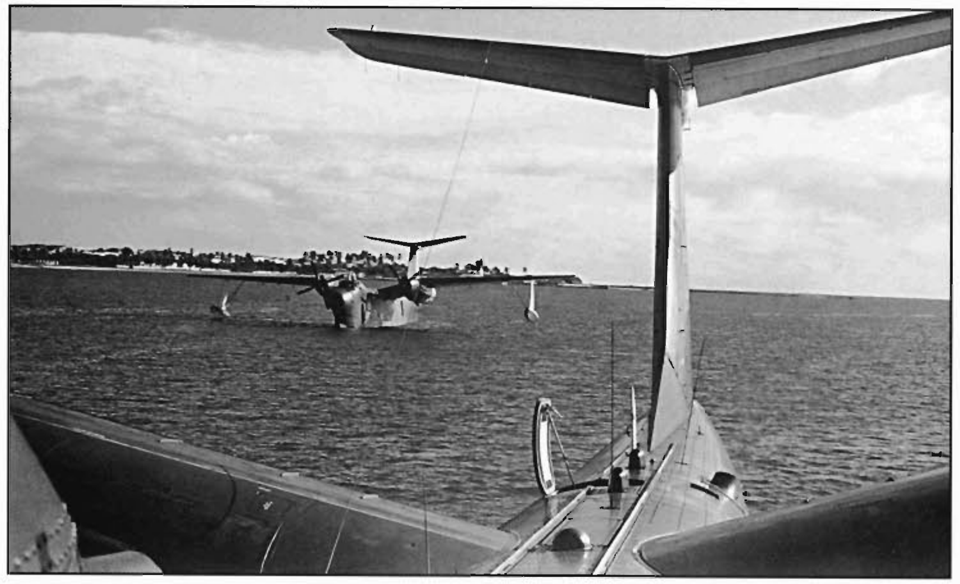
Because the broad expanse of Corpus Christi Bay allowed "splash and dash" landing practice, three or four touch-and-go landings in a straight line, the crash was far from the air station. Fortunately, the crash was observed by a nearby oil drilling support boat. Within about five minutes of the crash, the oil boat, skippered by Bo Staples of the Layton-Brown Drilling Company, reported the crash by radio and proceeded to the scene to pick up all of the men in the water (save the two in the life raft, who were not moved for fear of aggravating their injuries). Another Marlin landed and flew the injured men to the Naval Air Station for treatment. Navy crash boats soon arrived and transferred the other survivors from the oil boat.

Coincidentally, about the time of this accident, the author was performing rough water open ocean landings as part of the P5M Seaplane Sonar project. Based on his experience with these landings, the author wrote an article entitled "Reverse English" for the U.S. Naval Aviation Safety Center magazine *Approach* (November 1959), recommending against using the "reversing in the air" technique.

Two days after accident, the injured men had been replaced in the U.S. instructor crew, and the combined US/French crew was back in the air. Aircraft training at Corpus was completed with cross-country and night flights and on 27 March 1959, the French crews boarded the old Commando for the flight to Norfolk, Virginia. In Norfolk the French crews inventoried and receipted for their brand new Marlins and began two weeks of training in the Marlin's tactical systems with FAETULANT and VP-44. Each crew made six flights: firing rockets, dropping mines, system trouble-shooting and lots of low altitude Magnetic Anomaly Detection (MAD) cloverleafs. Commander Joe Davis remembers some of those flights: "I was one of the fam/check pilots briefly when our squadron, VP-44, was assigned to check out two French crews in their new P5M-2s. As near as I can remember, my chief qualification was being a Patrol Plane Commander (PPC) and having had high school French. Digging out my old log books, I found that I flew with LTJG. Courtois in BuNo 146445 on July 22, 28 and 29; and with LT Wantiez on July 30 in BuNo 146444. Both airplanes were brand new and the crews handled them well. However, it was strange to hear excited French chatter on the ICS and wonder if everything was okay; fortunately, it was, because high school French eight years earlier doesn't exactly make you conversant in the language. Both LTs Courtois and Wantiez spoke understandable English and both were excellent pilots."

Capt. "Hap" Hill recalled that on 5 May 1959, RADM Pierre Poncet, the French Naval Attache in Washington, sent a letter to the Commander Fleet Air Wing Atlantic expressing his

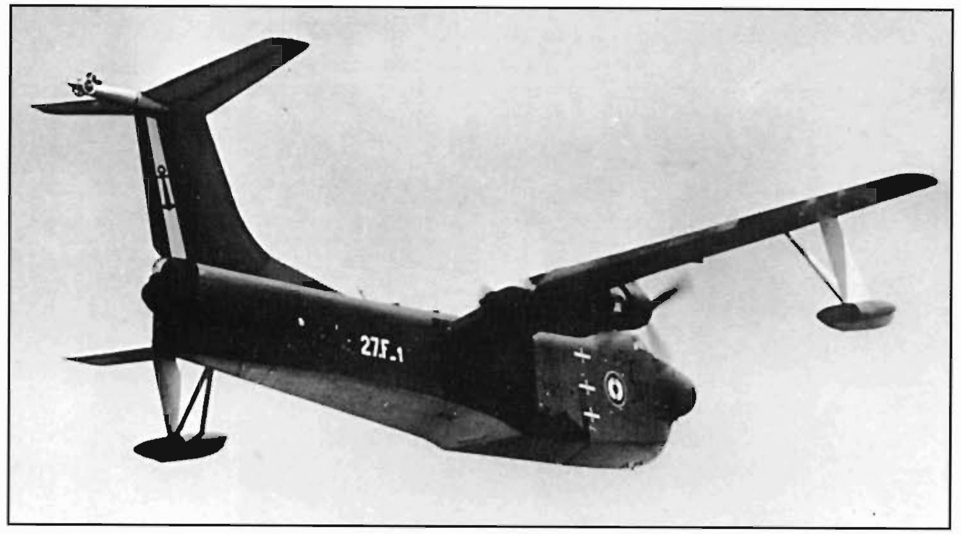




Above, French Marlins enroute to Dakar on moorings at Belem, Brazil, in 1959 during their ferry flight. (Pierre Margeridon) Bottom, after delivery the French Marlins had 27. F. 1 painted on their fuselage side in white to signify the squadron they were assigned to. (via Hoffman)

thanks and appreciation for the command's help as well as that of the Commanding Officer of VP-44, CDR "Champ" Thompson and his senior officers. It read in part: "It would be greatly appreciated if the expression of our thanks could be made known to all those who helped make that training feasible and successful. LCDR Hill, Maintenance Officer, his Assistant Ensign Dowling, the Plane Captains and Radiomen who shared all of our pilots' flights, guided them with skill and kindness, and, last but most assured not least, their devoted instructors, the LTs Johnston, Stubben, Vaughn and Kugler, as well as their liaison officer, LTJG Haven, whose patience and courtesy never faltered." A further closing comment: "The cocktail party offered our pilots and crews by VP-44 was in keeping with the best traditions of American hospitality and will be remembered by all with the utmost pleasure."

Because of minimal facilities enroute, the Marlins would fly to Dakar in pairs. On 1 May 1959, the two aircraft piloted by LCDR Labit and LTJG Courtois departed Norfolk for Guantanamo, followed on the 2nd by those piloted by LT Froget and LT Boulier. The French Marlins were ramped at Guantanamo and Trinidad for servicing and refueling.



All went well until the second group arrived in Trinidad and the Auxiliary Power Unit (APU) of LT Froget's aircraft failed. There were no spares in Trinidad and a replacement had to be flown from the Martin factory. The first group had planned to remain in Belem until the repairs were made to the second group, but the seaplane mooring buoys in Belem were marginal and after a night fighting a dragging anchor in the strong current, the first group decided to go on to Natal and Dakar.

It took eight days for the new APU to arrive in Trinidad, but when it did, replacement was done quickly and the second group departed for Belem. Refueling in Belem was done from a truck on the shore with the refueling hose supported by inflated inner tubes. The refueling is reported to have taken "half a day". Because of the marginal moorings, a safety watch was set for the night.

The first group found the buoys at Natal to be satisfactory, and refueling was done in a manner similar to the procedure at Belem. Because flying boat support was almost non-existent by 1959, the author was intrigued by the fact that seaplane moorings were available at Belem and Natal for the French Marlins. Research revealed that in February 1959 the Argentine Navy had staged six newly-purchased PBM Mariners through Belem and Natal and the author believes that the moorings used by the French Marlins were the same ones which had been set for the Argentine Mariners.

The first group of the Marlins arrived in Dakar on 10 May 1959. Margeridon made another trip to Norfolk and four more aircraft arrived in Dakar by August 6th. Eight Marlins were now operational with No 27F Squadron.

Training and operations had begun with the arrival of the first group. During August 1959, Margeridon recalls staging out of Port Etienne, Mauritania, for exercises with the British light carrier HMS Albion and simulated attacks on a transiting U.S. cruiser. Demonstrations were given to CDR Phillipe De Gaulle, son of the President, who was visiting Dakar as a member of a new aircraft committee, and by an authorized low altitude fly-by over the residence of the governor of West Africa, M. Messmer. The fly-by was so low some of the guests dived for the ground as the Marlin thundered overhead.

In October, Margeridon made a third trip to Norfolk for the delivery of the final two Marlins. The trip was uneventful except for the mooring situation in Belem. During the night high wind and a strong current caused Margeridon's Marlin to drag its mooring. He had to start the engines and manuever to be able to use the aircraft's anchor. Another anchor had to be brought from shore and set before the situation stabilized. The final two Marlins arrived in Dakar on 23 October 1959.

At first, all ten Marlins were kept at Dakar. The base, Base Aero Navale (BAN) Bel-Air, had been established in 1918. During World War II it was first controlled by the Vichy government, later by the Free French Forces of General De Gaulle. The base itself was small, for seaplanes only. It consisted of two hangars, a parking ramp and a ramp or slipway for beaching the seaplanes. The base was able to perform general maintenance, but overhaul-level work on the Marlins was done at Toulon in southern France. Later eight Marlins would be kept at Bel-Air' and two at Toulon. Bel-Air had no approach radar or electronic navigation aids. In bad weather the Marlins would have to make an instrument approach to the civil airport of Yoff, then maneuver visually or by their own radar to the seaplane alighting area. Night operations were accomplished by marking the sealane with "5 tiny rafts loaded with batteries and a lamp".

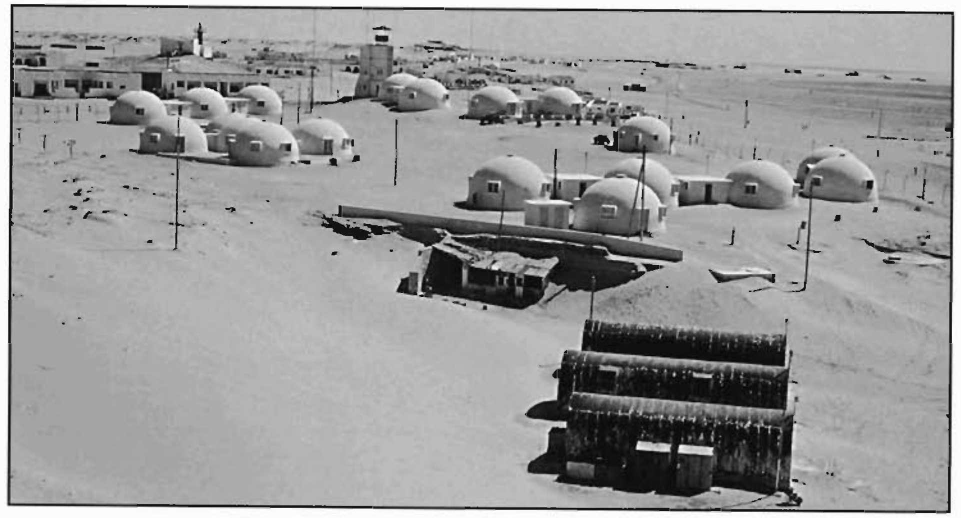
Living conditions at the base were excellent. It was considered a "resort" posting. Petty officers were billeted four to a room in a two-story building. Billeting was close to a nice beach and only a ten minute drive from the center of Dakar. Dakar at the time was the capital of French West Africa and was an attractive town with all the modern conveniences. Dakar was the only harbor with dry docks and facilities between Capetown and Casablanca.

Above and below, French Marlins on ramp at Base Aero Navale Bel-Air Dakar, West Africa, 1960. Note upper fuselage has been painted white to help reflect heat. (CDR Auguste Bihel)

Relations with the local inhabitants were very good; there was no problem in visiting the countryside for hunting or sightseeing. Margeridon recalls that, "There were no facilities in West Africa and we used to land on rivers or at sea, we moored in lagoons or where it was possible and often slept and ate on the plane. We did our food shopping in the local open-air markets using local pirogues to go back and forth to the plane. We really loved that way of life. To refuel, the gas truck came close to the shore and we put the hoses on the inner tubes of truck tires to reach the plane".

But life in 27F Squadron was not all fun and games. Each crew averaged more than 300 hours per year. The Marlins were the only long-range Search and Rescue (SAR) aircraft in West Africa and Dakar was a necessary stop for all airliners bound to South Africa or South America. 27F Squadron kept one crew ready to go and a second in standby, a tough job for only 8 crews. Louis Leziaud, in his article: "Les Marlin dans L'Aeronavale", recounted a SAR incident in 1962 in which two children were saved and another in 1963 where lifesaving equipment was dropped to a cargo ship stranded on Bissagos archipelago.

The primary mission of 27F Squadron was to represent France in that part of Africa. From Dakar it was tasked to protect the transit of North Atlantic Treaty Organization (NATO) ships from a possible Soviet submarine threat. ASW missions were not



Above, Igloos for the Penquins, French Marlin aircrew quarters at Port Etienne, Margeridon. "Sun Sand and Flies" (Pierre Margeridon)

easy and it was necessary to send the Marlins to France for training with submarines. The planes were based near Brest and ground training was conducted at Lorient's BAN Lann Bihoue where there were three squadrons of Lockheed P2V Neptunes and ASW training devices.

The monitoring of surface traffic was also important because of the various insurrection movements in the area. The East Bloc countries supported these movements by bringing in weapons and terrorists. One of the hottest points was in Guinea which had come under Soviet and Chinese influence after independence in 1958

The Spanish Sahara (Rio De Oro) was also a problem area. It was claimed both by Morocco and the non-official Sahari Republic supported by Algeria. To be closer to that problem the Marlins flew many missions out of Port Etienne (now Nouadibou) which had been a stop in the 1930s for postal aviation between Europe and South America. Margeridon recalls: "We had a few military barracks but no harbor, just a wooden wharf. No radio navigation facilities around and often sandstorms, we had to land with the help of our own radar and a little local lighthouse. Once a week an aircraft had to bring food, various goods and personnel over there. We used to stay 2 or 3 days making survey flights along the desert coast looking for merchant ships close to the shore and in contact with caravans of nomads. Often they were just exchanging fish, onions and food for salt or sheep." While in Port Etienne, aircrews were quartered in small "igloo" shaped buildings. (The igloo shape was apropos, for the nickname of aircrew in the French Navy was "Penguin").

Another mission was to keep an eye on Korean and Soviet fishermen working in forbidden areas. Some of these ships had more antennas than a light cruiser!

Although the Marlin was known as a high-maintenance aircraft, available records indicate that the Aeronavale had no particular problem supporting the Marlins. Corrosion was always a problem in the high temperatures and humidity of Africa and planes were brought up the ramp whenever possible and thoroughly washed with fresh water. Because of the swells and rough water in many seaplane operating areas, many take-offs were made using JATO. When problems did occur in West Africa, they happened in very exotic situations and locales.

During a night take-off from Saint Louis, Senegal, a Marlin suffered an engine failure. The plane narrowly missed the huge old iron bridge linking the two parts of the town, but was able to land safely on one engine. The engine was changed with difficulty on the river.

While visiting Abidjan, Ivory Coast, a Marlin suffered an APU failure with a Very Important Person (VIP) on board. In order to expeditiously return the VIP to Dakar, the radioman borrowed two "huge" batteries from a French Army armored vehicle and was able to start the engines and take-off.

One aircraft was kept for a time at Pointe Noire, Congo, for SAR standby and to transport VIP like Président Fulbert Youlou of Congo. There were no ramping facilities but a French Navy vessel was assigned to act as a seaplane tender. One aircraft had to change a propeller on the river, another had a fire induced by a Jet Assisted Take Off (JATO) rocket, but was able to extinguish the fire and resume the VIP flight to South Africa the same day.

One day the admiral of Dakar was aboard and decided to play King Neptune and christen a VIP that had never crossed the Equator with a pail of seawater. When the navigator announced the crossing the pilot decided to open the hydroflaps and put the plane into a steep dive as was done to investigate merchant ships. For a moment this put the crew into a weightless situation and the admiral received a part of the pail of water!

In 1964, while remaining a committed ally of the West, France withdrew from NATO. Although the MDAP agreement specified that the Marlins be returned to the United States in this case, Commander Auguste Bihel, commanding officer of 27F Squadron at the time, has stated that return of the aircraft was never formally requested by the U.S. Navy. According to Commander Bihel, the decision to return the Marlins was driven by their high maintenance and support cost and by the fact landplanes could now be used to perform their missions.

Because of the planned disestablishment of 27F Squadron and the turn-over of Bel-Air to the Republic of Senegal (granted independence in 1960) for use as a helicopter base, 27F personnel had been drawn down so that only five complete Marlin crews were available for the return flights.

A plan was developed for the Marlins to be returned in two groups of five aircraft. After the arrival of the first group in the United States, the crews would return to Dakar to deliver the second group. The return flights of the Marlins were planned to go from Dakar to France and then follow a northern route via Iceland and Labrador to the United States. Commander Bihel tells us that the northern route was selected for safety reasons. It was calculated that the southern route from Dakar to Brazil would have a two-hour period when the aircraft would be too heavy to maintain flight in the event of an engine failure.

A French liaison visit to the U.S. Naval Air Station in Keflavik, Iceland, made arrangements for mooring and refueling at Reykjavik Harbor. Contemporary international aeronautical publications indicated that satisfactory mooring and refueling facilities were in place at Goose Bay, Labrador.

On 5 August 1964, the French Marlins began to depart Dakar for the United States. The first leg was from Dakar to Port Etienne, Mauritania. After refueling, the Marlins flew north, skirting the coasts of Portugal and Spain to the French Lanveoc-Poulmic naval base at Brest in Brittany. LT Prevot experienced an engine failure about two hours after leaving Port Etienne and had to return there. A crew from Dakar flew in a replacement aircraft for Lt Prevot and the Dakar crew changed the bad engine on the water.

During the time the Marlins were gathering at Brest, flights in a Lockheed SP-2H Neptune were made to survey the water at Reykjavik and at the alternate at Shannon, Ireland.

On 16 August 1964, the first Marlin left Brest for Reykjavik. The flight was without incident and the U.S. Navy in Keflavik had provided mooring buoys, refueling facilities and personnel boats. The flight itself from Reykjavik to Goose Bay, Labrador, in Canada again was without unusual problems except for a carburetor failure on Commander Bihel's aircraft, but when the first Marlin arrived at Goose Bay, it was discovered that there had been a communications breakdown. Although proper diplomatic notice had been given, neither Canadian nor U.S. personnel at the base seemed to have any idea that the Marlins were heavy flying boats. The first Marlin was given an instrument approach to a land runway and had to announce "I have no wheels" in breaking off the approach and proceeding visually to land in the bay. There were mooring buoys in the bay, but they were "tiny" things suitable for light float planes. Larger buoys were quickly installed for the following aircraft. Commander Bihel remarked that base personnel were most helpful and hospitable and that U.S. personnel helped with the needed carburetor change.

Above, French base at Dakar in 1959 with two moored Sunderlands. (Pierre Margeridon)

The final leg from Goose Bay to Norfolk had the first Marlin of the group arriving on 24 August 1964, with the last arriving a week later. Aircrews were returned to Dakar via Lajes in the Azores by a Military Air Transport Service (MATS) Douglas C-118.

The second group of five repeated the evolution with the last of French Marlins arriving in Norfolk on 20 September 1964. The Marlins had flown over 11,000 hours in just over five years of French service in Africa. There had been no major accidents or injuries; there had only been one repairable ramp accident. After arrival in Norfolk, the Marlins were inspected by U.S. Navy personnel, who were very favorably impressed with their good condition. One USN officer stated that they were in such good condition that they could be returned to the U.S. Navy inventory.

Since the ex-French Marlins were relatively low-time aircraft in good condition, there is the possibility that they were put into U.S. Navy service after their return. However, by late 1964 the Marlin was being replaced in the U.S. Navy by the P3 Orion and only three Marlin squadrons were still active. The ex-French Marlins were not needed. Examination of their U.S. Navy Aircraft History Cards show that they were not returned to Navy inventory after return. They were probably scrapped in Norfolk.

After the return of the Marlins, 27F Squadron was disestablished on 1 October 1964, ending French Navy flying boat operations that had begun in 1912.

Above, ceremony for the last flight of a seaplane at NAS North Island on 6 November 1967. (USN) Below and bottom, on 6 November 1967 the last seaplane flight takes off. (USN)

THE LAST MARLIN

After the Marlin made the last squadron flight of a seaplane on 6 November 1967, all of the retired aircraft in the United States were parked in the "boneyard" at North Island to await scrapping or other disposal. I know of no specific plans at the time to place any of the Marlins in appropriate museums. Fortunately, about this time the Smithsonian Institution was in the planning stage for an "National Armed Forces Museum" and in early 1968 had requested the Navy donate a Marlin to that museum. The Navy agreed and the Naval Air Systems Command directed the Naval Air Rework Facility (NARF) to restore one Marlin to flyable condition for a ferry flight from North Island to NAS Patuxenr River, MD. The Marlin would be stored at Patuxent River until it could be moved to the new museum. BuNo 135533, the same aircraft that made the final squadron flight, was selected to be the Smithsonian aircraft.

BuNo 135533 had been delivered to the Navy in May 1956, and was first assigned to Air Development One (VX-1) in Key West where the author flew it for testing the ASQ-8 Magnetic Anamoly Detection (MAD) system, the APA-69 Electronic Countermeasures (ECM) system and the British SSQ-1 passive directional sonobuoy. After VX-1 duty, in 1958 it was assigned to Atlantic Fleet squadrons VP-44 and VP-56. In 1963 it was transferred to the Pacific Fleet and at various times served with VP-40, VP-42, VP-48 and VP-50. In late 1965 it began an extensive overhaul by the Fairchild Corp. in St Augustine, FL. It was not returned to San Diego for assignment to VP-50 until April 1967. Its final assignment was to VP-40 in June 1967. The short time between the overhaul and retirement in November 1967 indicates that the aircraft probably was in excellent condition and this was a factor in its being selected for the Smithsonian.

The restoration went smoothly and by May 1968 the aircraft began methodical pre-flight testing. Flight testing began in June and no major problems were uncovered. The airplane was scheduled to depart San Diego on 8 July 1968.

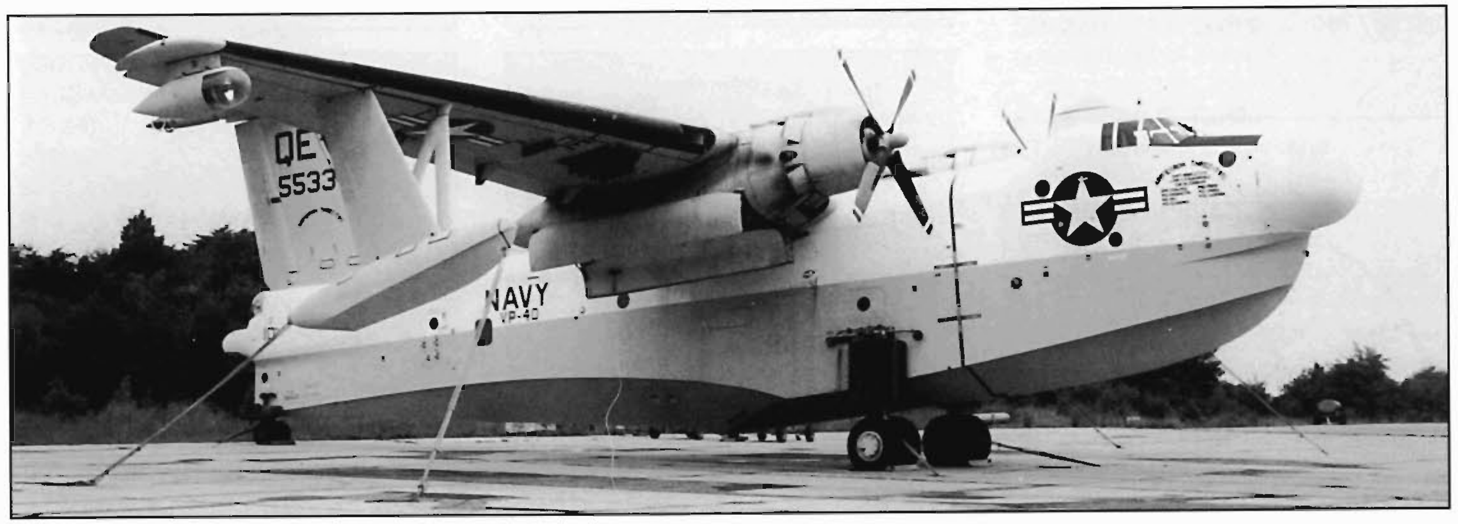
Above, 135533 in 2004. (Ginter) Below, the last Marlin BuNo 135533 in outdoor storage at Pax River in 1969. The bow writing was the ferry flight crewmen's names. The tail sported an AIRFERRON THREE-TWO flash. (Fred Roos)

With a flight crew from Aircraft Ferry Squadron Thirty-Two (VRF-32), departure was on schedule. The flight to the East Coast was planned with stops at the old seaplane bases at Corpus Christi, TX, and Jacksonville, FL. Upon arrival at Patuxent River on 12 July, the Marlin was greeted by dignitaries VADM Thomas F. Connolly (DCNOAIR), Mr. John Nicholas Brown, a Smithsonian Regent and chairman of the National Armed Forces Museum advisory board, and Mr. John Rauth, President of Martin Marietta Aerospace Corporation. Incidentially, Mr. Brown had been Assistant Secretary and Acting Secretary of the Navy during the Truman administration. ADM Connolly presented Mr. Brown the logbooks of BuNo 133553, a symbolic transfer of title from the Navy to the Smithsonian Institution. After the short welcome and transfer ceremony, the aircraft was towed to the periphery of the Flight Test Division ramp where it was tied down and given a minimal preservation treatment. It was to remain there for the next seven years.

The plans for the National Armed Forces Museum were abandoned and nobody seemed to know what to do with the Marlin. Fortunately, title now rested with the Smithsonian and it could not be destroyed by the Navy in a base clean-up program. In the mid-70s, the National Museum of Naval Aviation (NMNA) at NAS Pensacola, FL, was expanding its collection and requested that the Smithsonian place the Marlin on a "permanent loan" to NMNA. The request was granted and plans began to transport the aircraft from Patuxent River to Pensacola. By this time, restoration of the Marlin to a flight-worthy state would have been extremely difficult and expensive. Because of its size, the only practical way to move it was by water. In 1975, the wings were removed and the disassembled Marlin was loaded on a barge for the journey to Pensacola.

After arrival at Pensacola, it was reassembled and given exterior restoration. It was placed on display in 1977 and remains so to this day, a worthy tribute to the Navy flying boat.

CDR T. I. Bigley recalled that he saw BuNo 133553 at Corpus Christi on its way to Patuxent River, and "a few years later, when visiting North Island, I spotted a boneyard full of the old retired birds in a remote corner of the base. Most were in derelict condition but three were right out of rework, covered with preservative and ready to go. I slipped through the tail hatch of one and found myself in what amounted to a brand new airplane - it even smelled new. On a subsequent visit, I was saddened to find that all but the three preserved birds had been chopped to pieces and bulldozed into a huge pile of jagged aluminum scrap. According to the civilians operating the scrap yard, the three remaining P5s were saved for static displays. However, only a month or two later, I returned to find that they, too, had been reduced to scrap.



P5 MARLIN LOSSES

A total of thirty-six aircraft were lost, thirty-four in squadron service and two while undergoing ground repairs. Eighteen of the squadron losses resulted in casualties (see pages 159-160).

BuNo	Squadron	Loss Date
126503	VP-44	7/13/53
126509	VP-42	6/59
126511	VP-46	5/21/54
127697	VP-46	9/28/54
127700	VP-40	8/16/56
127703	VP-56	10/13/59
127705	VP-49	11/9/56
127712	VP-42	12/26/62
127718	VP-40	6/26/60
130265	VP-56	4/9/55
130269	VP-48	4/6/58
130276	VP-49	1/61
130280	VP-40	4/20/59
130288	ATU-501	3/12/59
130291	VP-46	9/15/57
130304	VP-46	9/6/58
135465	VP-45	5/17/60
135466	VP-48	5/5/56
135468	VP-48	10/20/56
135472	VP-45	11/19/56
	(O&R Norfolk)	
135478	VP-40	8/2/62
135483	VP-48	1/1/59
135498	VP-50	2/11/60
135518	VP-56	11/11/56
135519	VP-48	4/1/59
	(BAR Baltimore)	
135523	VP-50	5/12/64
135525	VP-50	1/6/67
135529	VP-56	1/27/59
135535	VP-50	4/3or4/9/59
135538	VP-50	12/18/57
135540	VP-50	9/25/59
137847	VP-40	3/1/67
140141	VP-47	9/6/62
140144	VP-45	9/22/61
140150	VP-40	10/20/64
147937	VP-42	9/22/62

VP-45 SATAN'S KITTENS
CREW 9 PARKER CP

ALPHA CREW
A
VP FORTY FIVE

PATROL SQUADRON 42

END OF AN ERA
1911
1968
PATRON FORTY

CREW 10
10
RB
VP-42

PATRON 47
11

CREW ONE PATRON 47
1
VP-47
56 JAPAN 57

MARTIN P5M MARLIN CASUALTIES 1953 - 1967

13 July 1953

BuNo 126503: P5M-1; VP-44; Flying from NAS Norfolk, VA, on an ASW exercise, one engine failed and the other lost power. Forced to land in the open sea, the plane broke up. The pilot, whose back was broken, heroically attempted to save a crewman, but the crewman slipped out of his grasp.

AOU1 Walter H. Justice
AL1 Theodore (N) Kuzma
AD1 Delma C. Peddie
AL3 J. "W" Earnhart
AT3 John B. Greene
ADP3 Earnest B. Sowers
AT3 Richard E. Stewart

21 May 1954

BuNo 126511: P5M-1; VP-46; On a transpacific flight from San Diego to Pearl Harbor, the aircraft developed engine trouble about 400 miles east of Hawaii. After the failure of both engines, the aircraft made a power-off open sea landing and broke up. Survivors were picked-up by LST 975.

LTJG Kenneth F. Stout
AD2 Alwin V. Bormann
AL2 Donald E. Hicks
AT3 Jerry G. Goodrich

28 September 1954

BuNo 127697: P5M-1; VP-46; NS Sangley Point, Philippines. During the take-off run in poor visibility and heavy rain, the aircraft got off course because some of the sealane marker lights were out, and it flew into Sangley Point near the ammunition dump.

LT Albert S. Douglass
LTJG John A. Holmes
LTJG Robert G. Perkins
LTJG James G. Newbury
AD1 Raiford B. Robertson
AM1 William F. Dunable
AD2 Richard Elliott
AL1 James R. Miller
AL3 Gerald L. Olson
AT3 Max L. Mcgehee
ATAN Wiliam D. Mercer
AO1 Charles Collins

9 April 1955

BuNo 130265: P5M-1; VP-56; Aircraft got off-course during a night take-off run and hit a seawall at Willoughby Bay, NAS Norfolk, VA.

ATAN Joseph McDowell Barnes
AT3 Richard John Coughlin
AT3 John Charles Pustinger
AO3 Claude Frederick Howell

9 November 1956

BuNo 127705: P5M-1; VP-49; A Liberian freighter, the *Captain Lyras,* reported "a plane overhead in flames" north of Bermuda about 400 miles east southeast of New York (in the Bermuda Triangle). The freighter later reported hearing an explosion and thought it saw a life raft, but no trace of the plane or crew was found.

CDR John M. Sweeney
LTJG Charles W. Patterson
LTJG Cyrus E. Reid jr
PO1 Robert W. Taylor
PO2 Lyle F. Quimby
AT3 Wendell F. Beverly
AD3 Billy G. Comer
PO3 Jesse W. Grable
PO3 Richard W. Montgomery
AN Bobbie L. Sanders

11 November 1956

BuNo 135518: P5M-2; VP-56; Enroute from Horta Bay, Faial Island, Azores, (tended by *Currituck*) to Bermuda. with a VP-44 crew. The aircraft attempted a heavy weight take-off in rough seas. The aircraft porpoised, exploded and sank.

AD1 Charles H. Hoke
AT3 Jack A. Smelley
AD3 Richard L. Knight
AO3 Basil M Jakelski

15 September 1957

BuNo Unknown: P5M-1; VP-49; During a hurricane evacuation flight from Bermuda to Norfolk, an AN/APS-44 radar magnetron exploded in flight, killing one crewman. The aircraft landed safely at Elizabeth City, NC.

AO2 Alden M. Donston

9 December 1957

BuNo 130291 : P5M-1; VP-46; The aircraft was enroute from San Diego to the Martin factory in Baltimore and had spent the night at NAS Corpus Christi, TX. Shortly after take-off from Corpus Christi, the plane caught fire and crashed.

LCDR James Norman Schofield
LTJG Howard B. Dickerson
LTJG Roy W. Bruner Jr.
AMC Karl B. Dumler
AD2 John J. Lanna
AM3 Richard R. Keirmaier
AE2 Paul Faircloth
AE3 Daniel S. Kwas
AM Carl P. Renn

6 April 1958

BuNo 130269: P5M-1, VP-48, MCAF Iwakuni, Japan, crashed shortly after take-off.

LTJG Robert F. Cody
AE3 Robert J. Bartkowski
PR1 Donald R. Neilson
ADC Nicholas Chepult, Jr.
AT1 Robert P. Smith
ATCA James G. Williams
ADR3 "L" "A" Haggerty
AO1 Harold F. Rohm

1 January 1959

BuNo 135483: P5M-2, VP-48, near Decanso, CA. The aircraft was on a training mission from NAS San Diego to the Salton Sea seadrome. About 20 minutes after take-off, the aircraft experienced an uncontrollable fire in the starboard engine near the number 3 Power Recovery Turbine. The pilot, LTJG Collier, stayed at the controls and directed the crew to bail out. Eight men jumped successfully, but the co-pilot, LTJG Dickens, bailed out too close to the ground for his chute to open properly. LTJG Collier was lost in the subsequent crash. According to a VP-48 history, LTJG Collier was posthumously awarded the Distinguished Flying Cross for his unselfish act of bravery.

LTJG John G. Collier
LTJG Marshall E. Dickens

27 January 1959

BuNo 135529: P5M-2, VP-56, Willoughby Bay, NAS Norfolk, VA. About 150 miles from base on a night ASW exercise, the starboard Sundstrand unit overheated and caught fire. The engine was feathered and the fire subsided. The first radar approach to the fogged-in base was unsuccessful, forcing a single-engine goaround. The second approach seemed successful, but about ten feet off the water the port engine lost power. The aircraft rolled violently, a wing broke off and the fuselage tumbled and broke-up.

CDR Robert J. Murphy
LCDR Sherman C. Cagle Jr.
LTJG David H. Utter
ALC LloydV. Knudson

9 April 1959
BuNo 135535: P5M-2; VP-50; Based at MCAF Iwakuni, Japan, the aircraft disappeared while on patrol on 9 April 1959, after reporting: "Operations Normal, 33-38N, 126-11E". The wreckage of the aircraft was located the next day on a desolate peak of Halla-san Mountain, Cheju-Do Island, Korea.

LT Floyd G. Nelson
LTJG James L. Sullivan,
LTJG Audrice R. Traylor,
ALC Binkley Congleton,
ADC Garth W. George,
AD2 Bobby J. Abdo,
AT2 Gordon P. Kennedy,
AT3 Duane L. Peterie,
AE2 Earl J. Pleasant
AO3 James H. Mc Daniel

20 April 1959
BuNo 130280: P5M-1; VP-42; At NS, Sangley Point, Philippines. During preflight checks of the JATO electrical circuits, the JATO was fired inadvertently with the starboard JATO door not secured. The force of the JATO tore the door from its mount and the door with the burning JATO attached caromed through the afterstation, damaging the airframe and mangling and burning personnel. The aircraft sank. It was recovered the next day, but was so badly damaged as to be stricken.

ATR3 Norman B. Herrin
ADR3 Theodore G. Klaver
ATC Charles R. Wilkerson
AT1 James B. York

11 February 1960
BuNo 135498: P5M-2; VP-50; Based at NAS Whidbey Island, WA. During a training exercise in Puget Sound the aircraft lost a wing after a high velocity aircraft rocket (5" HVAR) exploded at launch.

LCDR Robert Fite Clement
LTJG Rex Fulton McAlister
LTJG Dean Burton Engle
AD1 Bennie Oliver Mathias
ATN3 Edgar MacLean Woods
ATNAN Dennis Ole Jacobson
ATR3 Robert Albert Perham
AMSAN Richard Clarence Brickey
AO3 Douglas Dale Winters

22 September 1961
BuNo 140144: P5M-2S; VP-45; The aircraft was based at Bermuda and crashed at approximately 35-10N, 65-10W. A few weeks after the accident, one of the survivors, AT1 Jack M. Dockery, stated that before the aircraft crashed they had first lost an engine, then the hydraulic system, and were unable to gain altitude. The pilot and co-pilot were fighting to keep the aircraft in the air and several of the mechanically rated crew members were in the rear of the aircraft trying to repair the hydraulic problem. Out of a crew of ten only three survived the impact of the plane hitting the water, which was so severe that it tore the fuselage in half between the radio and ECM operators positions.

LCDR A. J. Tait
LTJG R. F. Carroll
LTJG C. P. Cooper
ADR2 C. R. Dunaway
AT2 D.W. Wood
AE3 E. D. Thompson
AO3 C. Turner

2 August 1962
BuNo 135478: P5M-2S; VP-40; Based at the NS Sangley Point, Philippines, the aircraft was conducting ASW exercises with a U.S. submarine. On return flight to Sangley, it ran into severe weather. The lone survivor, AE2 Joseph "Bernie" Daugherty, stated he believed a lightning strike disabled the instruments. The pilot attempted to climb and allow the crew to bail out, but the aircraft struck a mountain.

CDR Norman P. Vegelahn
LTJG J.L. Criscoe
LTJG William L. Locke
ENS B. B. Burton
ADR2 Robert T. Bluford
ATR3 Paul A. Waterhouse
AT1 B.G. Clarke
AO2 G.C. Bettis
AMH3 J.R. Cruz
ATN3 Henry B. Brown, Jr.
TDC T.E. Bowman
ATN3 John G. Faulkner

22 September 1962
BuNo 147937: P5M-2; VP-42; The aircraft was on temporary assignment at the NS Kodiak, AK. It was on a routine reconnaissance flight when it disappeared about 150 miles southeast of Anchorage, AK. It crashed into a mountain at about the 1900 foot level on Montague Island, AK.

LCDR Henry B. Nix
LT Allen Feinstein
LTJG Lawrence S. Hembree
AE1 Romy G. Bradberry
AT3 David L. Hart
AT1 Robert J. Joss
AT3 James L. Kirkey
AD2 Ralph C. Poort
AMSAN Ralph "D" King
AO2 Hiram R. Hurd

26 December 1962
BuNo 127712: SP-5A; VP-42; Disappeared while on a night patrol mission at a position estimated about 350 miles southwest of San Diego.

LT David K. Lukefahr
LT Harry Symons Jr.
LTJG George A. Pitts
LTJG Richard A. Larson
LTJG Peter A. Cargen
AT1 Robert F. Powell
AE1 Dale H. Spousta
ADR2 William S. Whipple
AT2 Carl B. Dickie
AT2 Terence E. Smith
AMHAN James F. Bramlett
ATN3 David K. Eiffe
AO2 Robert F. Warmack

6 January 1967
BuNo 135525: SP-5B; VP-50; Based at NS Sangley Point, Philippines, the aircraft crashed during a training flight west of Corregidor. Entire crew was lost, no bodies were recovered.

LT David A. Stevens
LTJG Gary L. Howell
LTJG Jack M. Morris
AX2 D.F. Lewis
AT3 Larry J. Creighton
AOAN Ronny L. Steen
AMS3 Everett N. Whitmire
ATRAN Charles M Goetz
AE3 William R. Gunter Jr.
ATR3 Paul M. Goslin

In researching this book, I came across ten fine reference books that discussed Marlin production. There was an appreciable difference between the total Marlin production numbers given in these books. Inasmuch as I had access to the complete library of the official U.S. Navy "Aircraft History Cards", I was able to verify each and every Marlin Bureau Number (BuNo) and match that number to a specific aircraft. My inventory showed 121 P5M-1 (P-5A) and 117 P5M-2 (P-5B), a total of 238 Marlins were produced and delivered. This total includes seven P5M-1s and four P5M-2s for the U.S. Coast Guard and ten P5M-2s for the French Navy. It does not include the one XP5M-1 which was a converted PBM-5.

MARLIN PRODUCTION

P5M-1 (P-5A, SP-5A) 121 Aircraft		
124910-124913	4	
126490-126511	22	
127696-127719	24	
130265-130306	42	
135452-135473	22	
149825-149831	7	(ex-USCG P5M-1Gs)
P5M-2 (P-5B, SP-5B) 117 Aircraft		
135474-135543	70	
137846-137848	3	
140140-140150	11	
141252-141258	7	
146440-146445	6	French Navy
147539-147542	4	French Navy
147926-147937	12	
149832-149835	4	(ex-USCG P5M-2Gs)

QE
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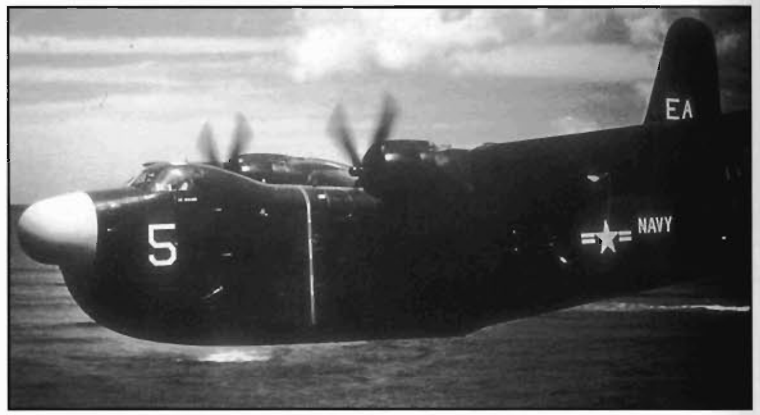
12

MARLIN PRODUCTION AND SERVICE HISTORY

BuNo	Accepted	Significant Assignments*	Strike Date
98616	5/48	XP5M-1, converted PBM-5, later became M-270 for P6M testing.	
124910	12/51	NATC, VP-46	5/61
124911	12/51	NATC, VP-49, VT-31	10/62
124912	12/51	NATC, VP-49	10/62
124913	12/51	NATC, VP-46	10/62
126490	3/52	VP-44, VP-49, VP-46,VP-48	5/64
126491	3/52	VP-49, VP-46	10/62
126492	3/52	VP-44, VP-49, VP-42	10/62
126493	3/52	VP-44, VP-42	7/63
126494	4/52	VP-44, VP-49, VP-42	10/62
126495	5/52	VP-44, VP-56	10/62
126496	5/52	VP-44, VP-48, VP-45, VP-44	10/62
126497	6/52	VP-40, VP-45, VP-47	10/62
126498	6/52	VP-44, VP-45, VP-56, VP-30	10/64
126499	6/52	Records not found	5/66
126500	7/52	VP-44, VP48, VP-40	7/63
126501	7/52	VP-45, VP40	7/63
126502	7/52	VP-40,VP-42, VP-44	10/62
126503	8/52	VP-44 crashed 7/13/53	7/53
126504	8/52	VP-48, VP-46	10/62
126505	8/52	VP-44, VP-49,VP-45, VP-40	10/62
126506	9/52	VP-49, VP-46	10/62
126507	9/52	VX-1, VP-49, VP-46	7/63
126508	9/52	VX-1, VP-49, VP-46	10/62
126509	9/52	NATC,VP-46,VP-42	6/59
126510	11/52	VP-48, VP-40, VP-49, VP-48	6/63
126511	11/52	VP-46 crashed 5/21/54	6/54
127696	12/52	VP-40, VP-48, VP-47, VP-46	6/63
127697	12/52	VP-40, VP-46 crashed 9/28/54	9/54
127698	12/52	VP-40, VP-48	5/64
127699	1/53	Records not found	5/66
127700	1/53	VP-40 sunk 8/15/56, Okinawa	8/56
127701	1/53	VP-40, VP-48	5/64
127702	1/53	VP-40, VP-46	10/62
127703	1/53	VP-40, VP-42, VP-56	11/59
127704	2/53	VP-56, VP-42	10/62
127705	2/53	VP-49 crashed 11/9/56	11/56
127706	3/53	VP-49, VP-46	10/62
127707	3/53	VP-49, VP-40, VP42	5/64
127708	3/53	VP-56, VP-49	6/64
127709	3/53	VP-56, VP-49	10/62
127710	3/53	VP-40, VP-42, VP-31	10/62
127711	3/53	VP-46, VP-48, VP-45	6/63
127712	3/53	VP-42 crashed 12/26/62	12/62
127713	4/53	VP-46, VP-40, VP-49, VP-56	6/63
127714	4/53	VP-40, VP-44, VP-46	10/62
127715	4/53	VP-46, VP-40, VP-48, VP-56	6/64
127716	4/53	VP-40, VP-46, VP-56	1/63
127717	4/53	VP-40, VP-48, VP-45	10/62
127718	4/53	VP-49, VP-40	6/26/60
127719	4/53	VP-49, VP-40	10/62
130265	5/53	VP-56 crashed 4/9/55	4/55
130266	5/53	VP-49, VP-46, VP-49	10/62
130267	5/53	VP-49, VP-44, VP-49, VP-44	6/63
130268	5/53	VP-49, VP-45	10/62
130269	5/53	VP-48 crashed 4/6/58	4/58
130270	5/53	VP-56, VP-42	6/63
130271	5/53	VP-56, VP-45, VP-56	10/62
130272	5/53	VP-56, VP-40, VP-42	6/63
130273	5/53	VP-56, VP-45	6/63
130274	6/53	VP-56, VP-42, VP-46	6/63
130275	6/53	VP-56, VP-46	10/62
130276	6/53	VP-49	1/61
130277	6/53	VP-56, VP-46, VP-48	5/64
130278	6/53	VP-56, VP-46	5/64
130279	6/53	VP-46, VP-42	6/63
130280	6/53	VP-46, VP-40 (4/20/59)	5/59
130281	6/53	VP-46, VP-40	6/63
130282	7/53	VP-46, VP-40, VP-49	6/63
130283	7/53	VP-46	10/62
130284	7/53	VP-46, VP-48, VP-46, VP-42	6/63
130285	7/53	VP-46, VP-45	10/62
130286	7/53	VP-46, VP-48, P5M-1 with T tail	10/62
130287	7/53	VP-42, VP-46	10/62
130288	7/53	VP-46, VP-40	3/59
130289	7/53	VP-44, VP-42, VP-56, VP-45	After '65
130290	7/53	VX-1, VP49, VP-46	6/63
130291	7/53	VP-44, VP-46 crashed 9/15/57	12/57
130292	7/53	VP-56, VP-45	10/62
130293	8/53	VX-1, VP-49	10/62
130294	8/53	VP-42, VP-48, VP-49, VP-56	6/63
130295	8/53	VP-46, VP-40, VP-42	6/63
130296	8/53	VP-42, VP-44	10/62
130297	9/53	VP-42, VP-49	10/62
130298	9/53	VP-42, VP-46, VP-56, VP-45	12/14//60
130299	9/53	VP-42, VP-48	6/63
130300	9/53	VP-40	6/63
130301	9/53	VP-46, VP-40, VP-56, VP-48	5/64
130302	10/53	VP-42, VP-40, VP-49	6/63
130303	10/53	VP-42, VP-40, VX-1	5/64
130304	10/53	VP-42, VP-46	9/16/58
130305	10/53	VP-40, VP-46, VP-56	10/62
130306	10/53	VP-42, VP-48, VP-46	6/64
135452	1/54	VP-48, VP-40, VP-49, VP-56	6/63
135453	1/54	VP-56, VP-45	6/63
135454	1/54	VP-44, VP-49, VP-40	6/63
135455	1/54	VP-40 (5/23/61)	5/61
135456	1/54	VP-45, VP-42, VP-31	6/63
135457	2/54	VP-49	6/63
135458	2/54	VP-45, VP-42	6/63
135459	2/54	VP-40	6/63
135460	2/54	VP-48, VP-40	6/63
135461	2/54	VP-45	10/62
135462	3/54	VP-45, VT-31	5/64
135463	3/54	VP-45, VP-49	10/62
135464	3/54	VP-45, VP-49	10/62
135465	3/54	VP-45 (5/17/60)	10/62
135466	3/54	VP-48 (5/17/56)	5/56
135467	4/54	VP-45, VP-49	6/63

Above, XP5M-1 BuNo 98516. (Martin) Below, VP-49 P5M-1 off San Juan, PR, in 1952 with early "EA" tail code. (USN)



Above, VP-49 P5M-1 BuNo 127709 minus an engine at NAS North Island, CA, on 25 August 1962. Note lightning bolt on the tail. (William Swisher) Below, VP-40 P5M-1 BuNo 135454. (via Burger)

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NAVY

NAVY
LM
0267
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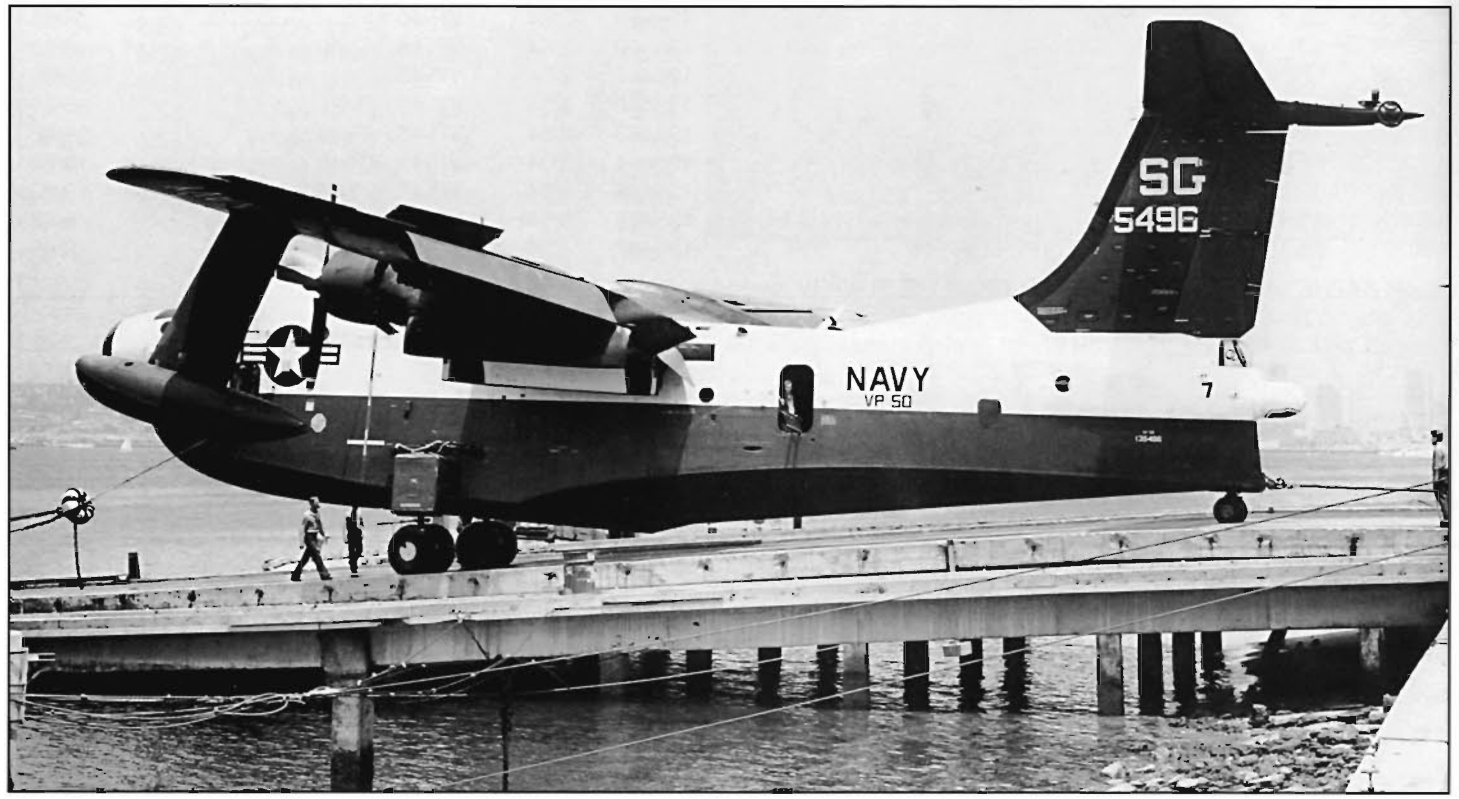
NAVY
VP 44

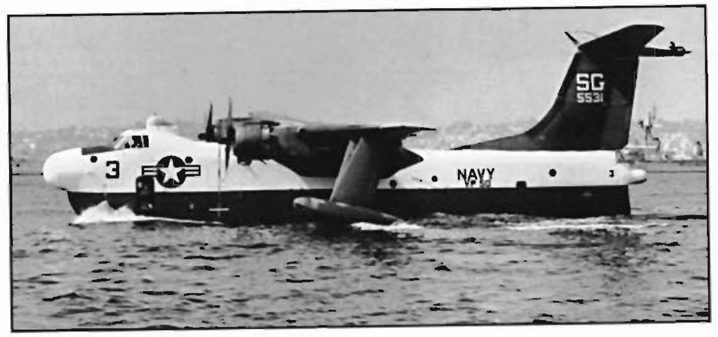
Above, VP-44 P5M-1 BuNo 130267 at NAS North Island, CA, on 25 August 1962. (William Swisher) Bottom, VP-50 P5M-2 BuNo 135540 with squadron insignia on the nose. (USN)

SG
135540
6
NAVY
VP-50

Above, derelict SP-5B BuNo 135509, location and date unknown. (via Burger) Below, VP-50 P5M-2 BuNo 135496 on the seaplane ramp at NAS North Island, CA. (USN)

135468	4/54	VP-48 (7/31/56)	10/56
135469	5/54	VP-45	10/62
135470	4/54	VP-45, VP-40	6/63
135471	4/54	VP-45	10/62
135472	4/54	VP-45 (11/19/56)	11/56
135473	4/54	VP-48, VP-46	6/63
135474	4/54	1st P5M-2, NATC, VP-47, VP-50	3/67
135475	5/54	VP-42, VP-48, VP-40, VP-47	5/67
135476	5/54	VP-42, VP-40, VP-47, VP-48	7/65
135477	5/54	VP-42, VP-50, VP-47, VP-40	4/67
135478	6/54	44,49,56,48 VP-40 crashed	8/2/62
135479	6/54	NATC, VP-56, VP-44, VP-42&40	4/67
135480	6/54	VP-47, VP-44, VP-40	10/66
135481	6/54	NATC, VP-56, VP-49, VP-45&30	3/67
135482	6/54	VP-47, VP-48, VP-40	4/67
135483	8/54	VP-47, VP-48 crashed 1/1/59	1/59
135484	8/54	VP-47, VP-42, VP-48, VP-47	3/67
135485	9/54	VP-47, VP-44, VP-31	6/67
135486	9/54	VP-47, VP-44, VP-45	5/67
135487	9/54	VP-47, VP-50, VP-48	5/67
135488	9/54	VP-47, VP-56, VP-49, VP-50	7/65
135489	10/54	VP-47, VP-56, VP-45, VP-31	6/67
135490	10/54	VP-47, VP-48, VP-45, VP-40	3/67
135491	10/54	VP-44, VP-45, VP-50, VP-47,40	10/66
135492	10/54	VP-47, VP-48, VP-49	12/65
135493	11/54	VP-45, VP-42, VP-40, VP-48	5/67
135494	11/54	VP-45, VP-50	6/63
135495	12/54	VP-44, VP-47, VP-45.VP-40, 50	5/67
135496	12/54	VP-44, VP-48, VP-47, VP-50	6/67
135497	12/54	VP-44, VP-45	7/65
135498	1/55	VP-46, VP-50 crashed 2/11/60	2/60
135499	1/55	VP-44, VP-45, VP-49, VP-47, 50	6/67
135500	1/55	VP-44, VP-47	6/67
135501	2/55	VP-44, VP-56, VP-30, VP-49, 45	3/67
135502	2/55	VP-44, VP-46, VP-40, VP-47	5/67
135503	2/55	VP-42, VP-50, VP-40. VP-47	7/66
135504	3/55	VP-49, VP-44, VP-48, VP-47&50	3/67
135505	3/55	VP-56, VP-45	3/67
135506	4/55	VP-42, VP-40, VP-50, VP-56, 49	7/65
135507	4/55	VP-42, VP-40, VP-44, VP-31	7/65
135508	4/55	VP-49, VP-56, VP-48, VP-40, 42	7/65
135509	5/55	VP-42, VP-40, VP-56, VP-49,47,48	5/67
135510	6/55	VP-42. VP-45	12/65
135511	6/55	VP-42. VP-50	6/65
135512	6/55	VP-42, VP-40, VP-44, 45, 49	5/67
135513	6/55	VP-45, VP-56	5/67
135514	7/55	VP-42, VP-40, VP-44, VP-45, 49	3/67
135515	7/55	VP-42, VP-50, VP-48	5/67
135516	8/55	VP-50, VP-42, VP-48, VP-40	4/66
135517	9/55	VP-50, VP-40, VP-47, VP-40	5/67
135518	11/55	VP-56 crashed 11/11/56	11/56
135519	11/55	VP-49, VP-50, VP-48 (4/1/59)	7/59
135520	10/55	VP-56, VP-47, VP-49, VP-31	12/66
135521	12/55	VP-56, VP-50	6/64
135522	11/55	VP-56, VP-44, VP-30, VP-50	6/67
135523	12/55	VP-56, VP-50 (5/12/64)	5/64
135524	12/55	VP-56, VP-44, VP-30, VP-31	6/67
135525	2/56	VP-56, VP-50 crashed 1/6/67	1/67

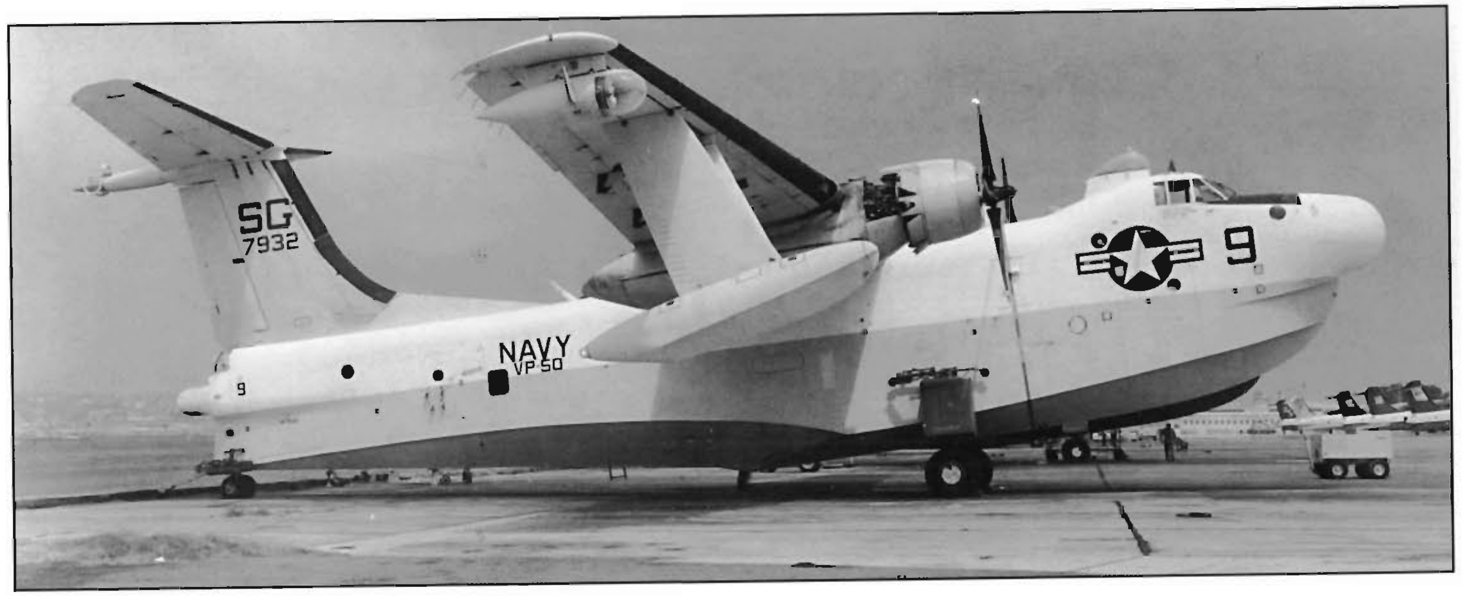




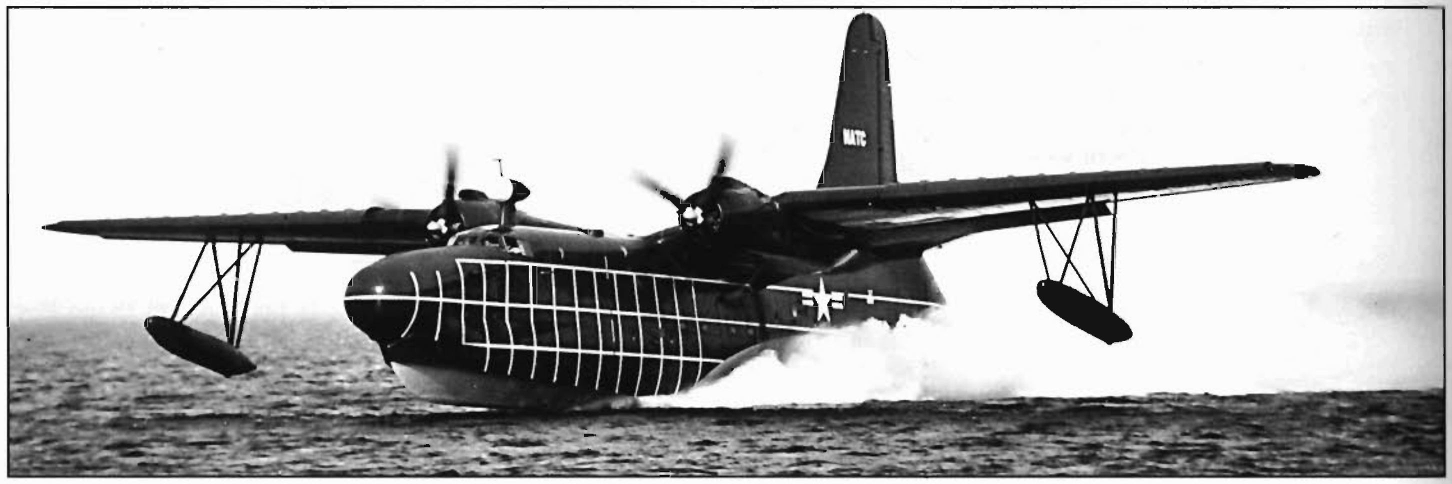
Above, VP-50 SP-5B BuNo 135531 taxis in San Diego Bay. (Clay Jansson) Below, VP-50 SP-5B BuNo 147932 at NAS North Island, CA, on 12 June 1965. (William Swisher)

135526	3/56	VP-44, VP-48, VP-50. VP-31,47,40	5/67
135527	7/56	VX-1, VP-44, VP-49	1/67
135528	4/56	VP-50, VP-40, VP-47	?
135529	4/56	VP-56 crashed 1/27/59	1/59
135530	3/56	VP-48, VP-40, VP-48	4/67
135531	5/56	VP-50, VP-31, VP-47, VP-50	6/67
135532	4/56	VP-47, VP-42, VP-40	5/67
135533	5/56	VX-1,VP-40, Preserved Pensacola	
135534	5/56	VP-50, VP-47. VP-50, VP-48	6/67
135535	6/56	VP-50 crashed 4/9/59 or 4/3/59	4/59
135536	6/56	VP-50. VP-40	6/67
135537	6/56	VP-50, VP-42, VP-47, VP-40	4/67
135538	8/56	VP-50 (12/18/57)	12/57
135539	9/56	VP-50, VP-47,40,42,31,47,50	12/66
135540	9/56	VP-50 (9/25/59)	9/59
135541	10/56	VP-40, VP-42, VP-31, VP-47	6/67
135542	10/56	VP-47, VP-49, VP-48	5/67
135543	12/56	NATC, VX-1, VP-40,50.47	5/67
137846	11/56	VP-40, VP-50, VP-48	4/67
137847	11/56	VP-40, Sunk 3/1/67, Sangley PT	3/1/67
137848	12/56	VP-48, VP-50	6/67
140140	3/57	VP-40	5/67
140141	1/57	VP-49, VP-44, VP-47(9/6/62)	9/62
140142	2/57	VP-40, VP-50	5/67
140143	4/57	VP-40	4/67
140144	5/57	VP-44, VP-45 crashed 9/22/61	9/61
140145	6/57	VP46. VP-50	5/67
140146	7/57	VX-1 (Sonar tests), VP-48	1/66
140147	11/57	VX-1 (Sonar tests), VP-40, VP-50	5/67
140148	11/57	VP-46, VP-50, VP-40	4/67
140149	4/58	NARF North Island	12/65
140150	3/58	VP-50, VP-47, VP-48, VP-40	10/64
141252	3/58	VP-40, VP-50	5/67
141253	6/58	VP-50, VP-40	3/67
141254	5/58	VP-48, VP-31	2/67
141255	4/58	VP-40	5/67
141256	6/58	VP-48	1/67
141257	8/58	VP-40	5/67
141258	8/58	NATC Jet Testbed	3/67
146440	8/64	From French Navy, Stricken	8/64
146441	8/64	From French Navy, Stricken	8/64
146442	8/64	From French Navy, Stricken	8/64
146443	8/64	From French Navy, Stricken	8/64
146444	8/64	From French Navy, Stricken	8/64
146445	9/64	From French Navy, Stricken	9/64
147539	9/64	From French Navy, Stricken	9/64
147540	9/64	From French Navy, Stricken	9/64
147541	9/64	From French Navy, Stricken	9/64
147542	9/64	From French Navy, Stricken	9/64
147926	4/60	VP-48, VP-50, VP-40	5/67
147927	4/60	VP-56, VP-45, VP-40, VP-50	3/67
147928	5/60	VP-48, VP-40, VP-50	3/67
147929	6/60	VP-47, VP-40, VP-50	12/66
147930	7/60	VP-49	12/65
147931	7/60	VP-31, VP-48, VP-40, VP-50	12/65
147932	8/60	VP-40, VP-50	12/66
147933	8/60	VP-42, VP-40,VP-47,VP-50	1/67
147934	9/60	VP-45	12/65
147935	12/60	VP-48, VP-50, VP-48	4/67
147936	12/60	VP-45, VP-40	6/67
147937	12/60	VP-42 crashed 9/22/62	9/62
149825	5/60	USCG 1297, VT-31	5/64
149826	5/60	USCG 1287, No Navy Records	6/63
149827	11/60	USCG 1296, VT-31	
149828	5/60	USCG 1285, VT-31	6/63
149829		USCG 1284, No Navy records.	
149830	5/60	USCG 1286, No Navy Records	5/63
149831	5/60	USCG 1295, VT-31	6/63
149832	5/60	USCG 1318, VT-31	5/64
149833	5/60	USCG 1319, VT-31	5/64
149834	12/60	USCG 1312, VP-31	
149835	5/60	USCG 1320, No Navy Records	5/63

* Not all assignments shown



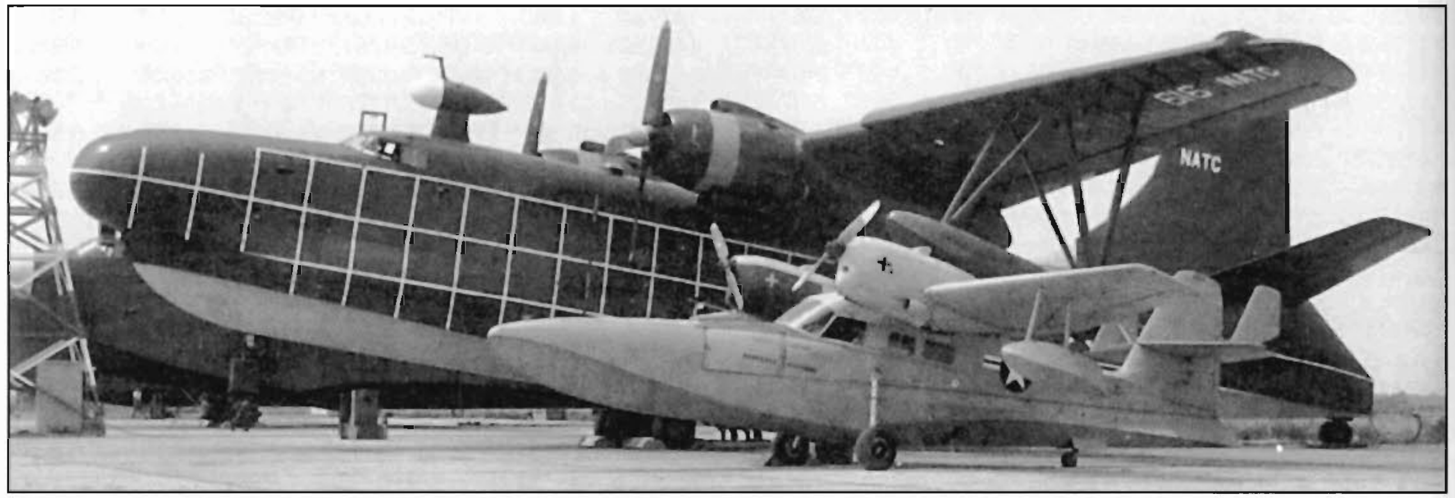
MARTIN M-270 HULL RESEARCH AIRFRAME

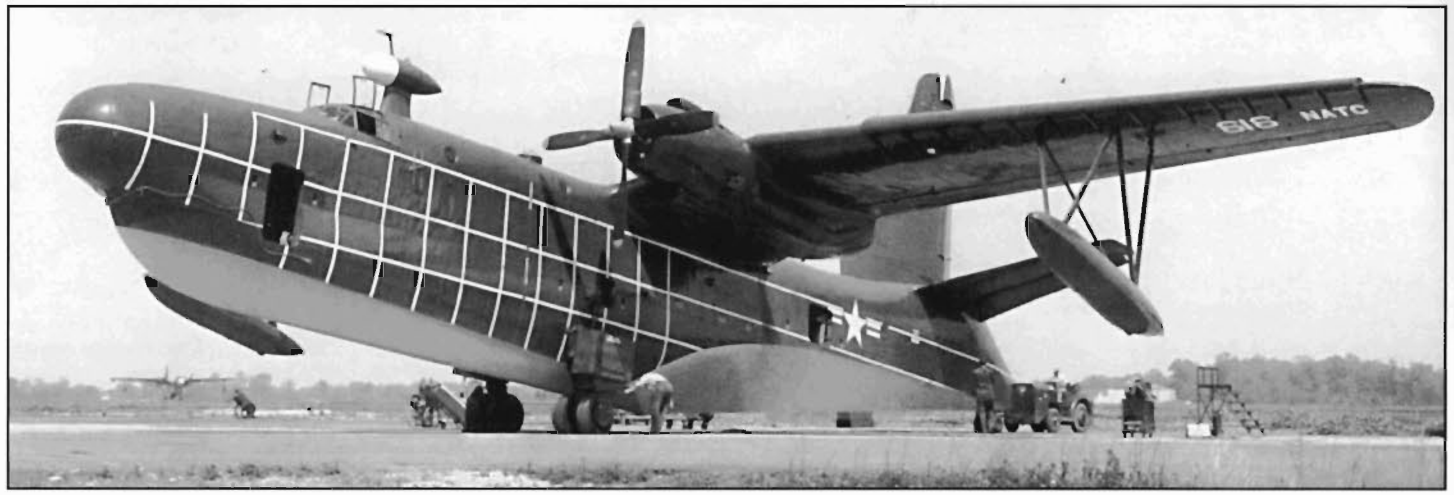


The XP5M-1 was returned to Martin in May 1951 for conversion into a proof-of-concept 15-to-1 hull ratio demonstrator. Designated the M-270, BuNo 98616, conversion was based on combined research by Martin, BuAer, NACA, and the Stevens Institute. The new hull was built over the existing one with six feet being added both forward and aft. The only change to the aircraft other than the hull was the installation of R-3350-30 engines.

The conversion was completed in May 1952 and flight testing proved the design successful. The design was incorporated into the P5M-2's hull and would be used in the P6M Seamaster.

Above, M-270 take-off run. (Martin) Below, the 15-to-1 hull was first tested on a Grumman J4F-2 nicknamed "Petulant Porpoise" seen next to the M-270. (Martin) Bottom, M-270 prior to initial taxi test on 6 May 1952. Note NATC codes still present under the wing. Testing continued into 1955 with the aircraft being named "The Bay Queen". (Martin)

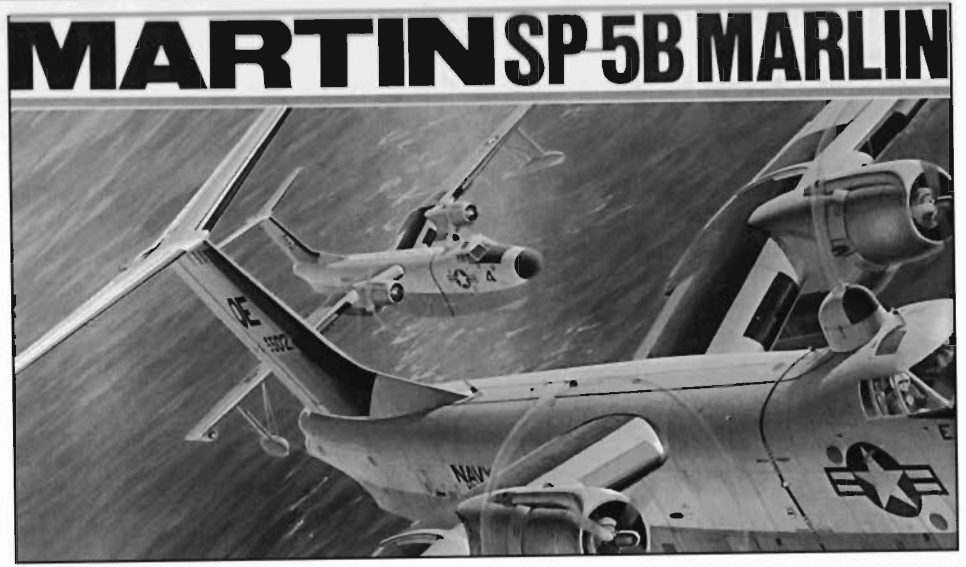


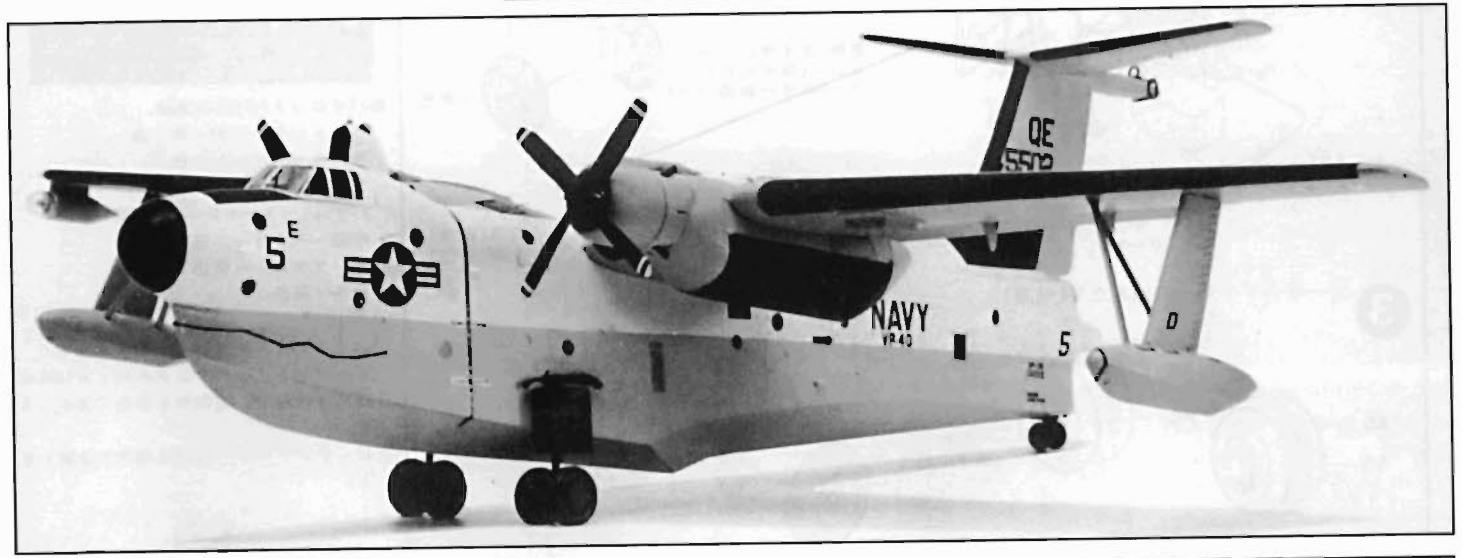


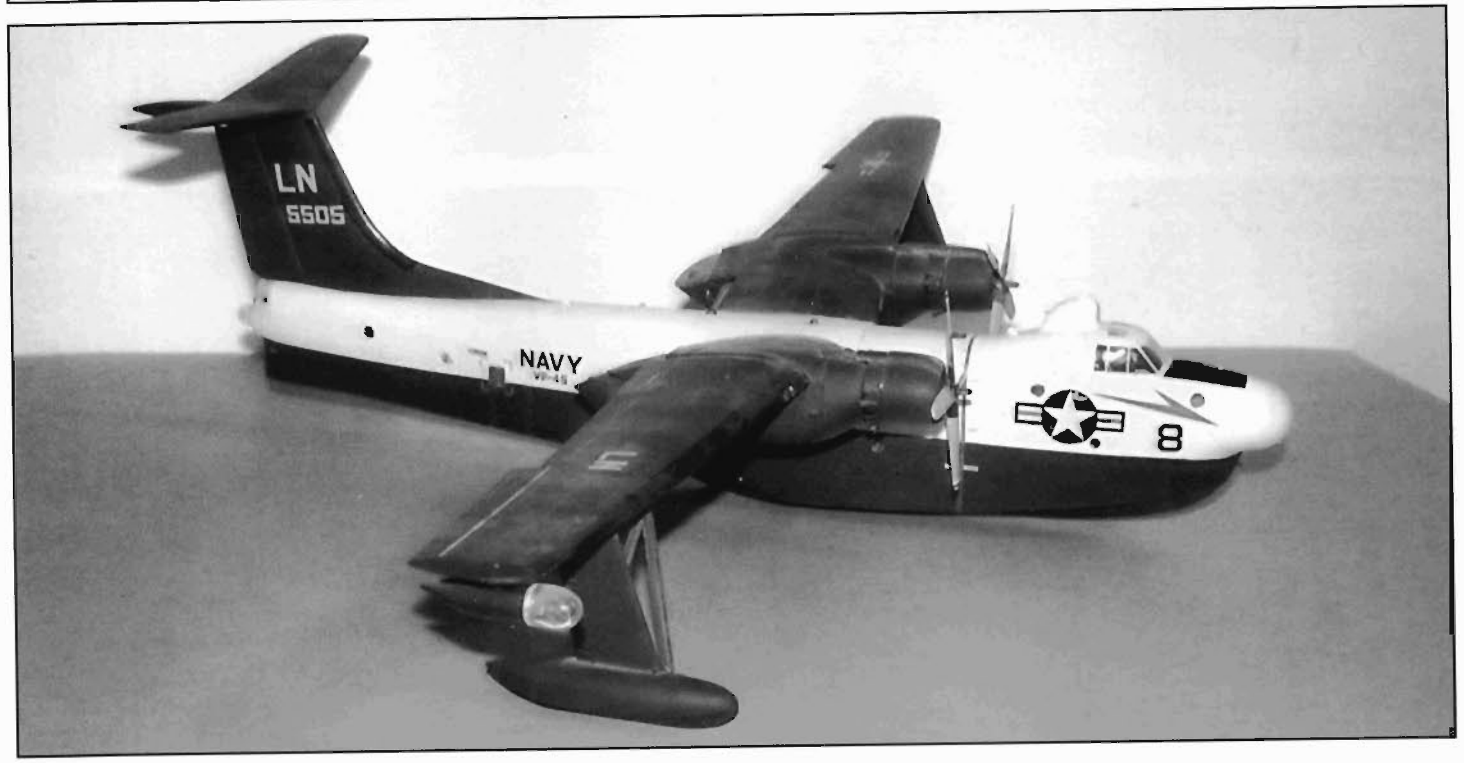
HASEGAWA 1/72 SCALE MARTIN SP-5B MARLIN

First issued in the early '70s, the Hasegawa kit has been continuously re-issued every couple of years. The models shown here were built in the early '70s in the kit markings of VP-45 and a Vietnam era gull grey and white VP-40 aircraft. The kit had alternate markings for and a French machine.

Features of the kit included beaching gear and poseable flaps, rudder, and cowl flaps. A pilot and copilot figure were also included.







MARTIN'S LAST SEAPLANE, THE P6M SEAMASTER

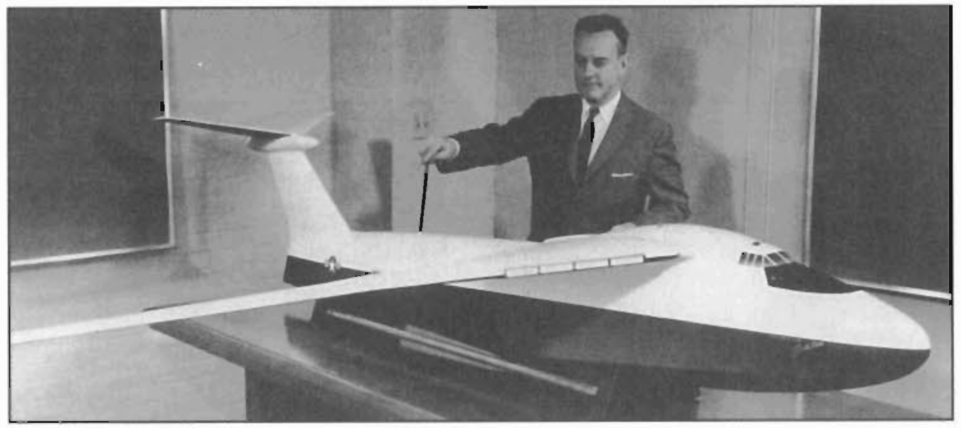
The P6M was Martin's answer to the Navy's request for a jet-powered seaplane bomber for its Seaplane Striking Force. Capable of operating from almost anywhere, the aircraft was required to carry conventional and nuclear weapons in a rotary bomb bay and to perform minelaying and reconnaissance missions at speeds that would rival the Air Force's land-based bombers. The aircraft was to be capable of Mach .9 dash speeds with a 30,000 lb payload to a target 1,500 miles away.

The first aircraft flew on 14 July 1955, and was followed by 15 more aircraft. Although plagued by two crashes early in the test program, the aircraft showed great potential, but was cancelled in 1959, due to a shift in priorities to the new Polaris missile submarine, the Forrestal Class Super Carrier, and the Mach 2 A3J Vigilante carrier-based bomber.

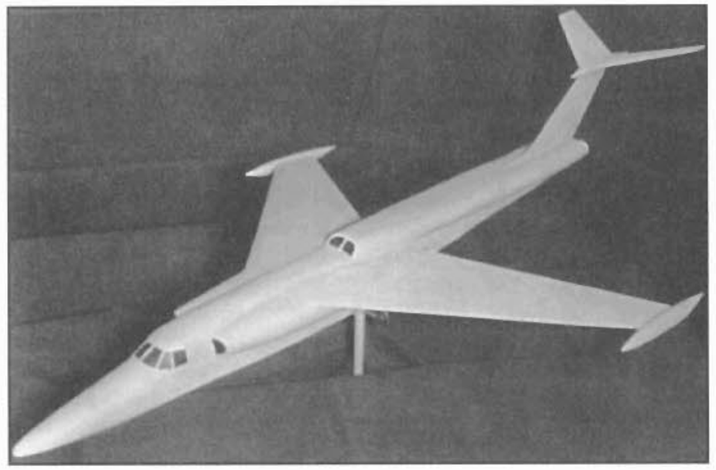
Three views of the impressive Martin P6M Seamaster. (Martin/USN)

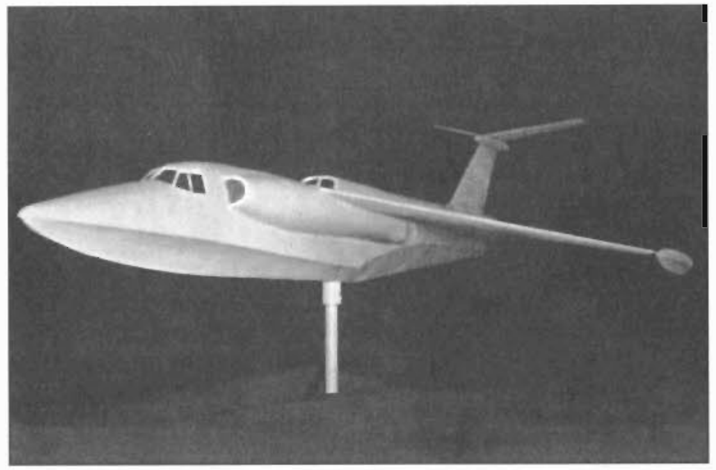
ADVANCED SEAPLANE CONCEPTS

MODEL 307: The "SeaMistress" was a Tactical Seaplane Transport concept for a 200+ ton bow loader. Expected speed was in the 600 knot range due to eight wing-embedded J75 engines. Then years later a landplane of similar size took to the air, known as the Lockheed C-5A Galaxy.

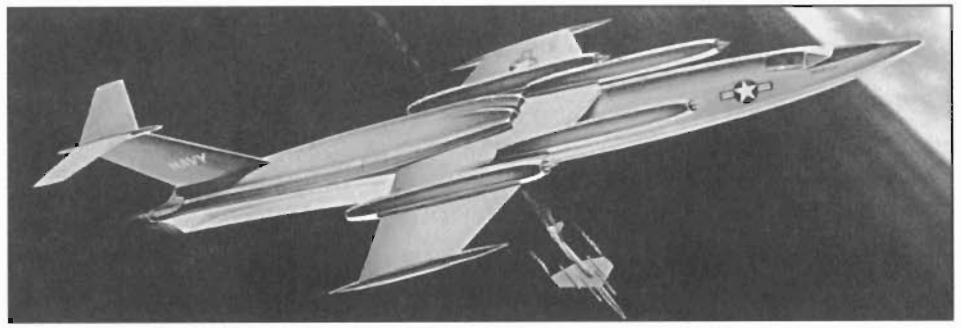


MODEL 316: The 1954 "Skipper" advanced flying boat concept featured the P6M hull and tail with fuselage-mounted engine installations.



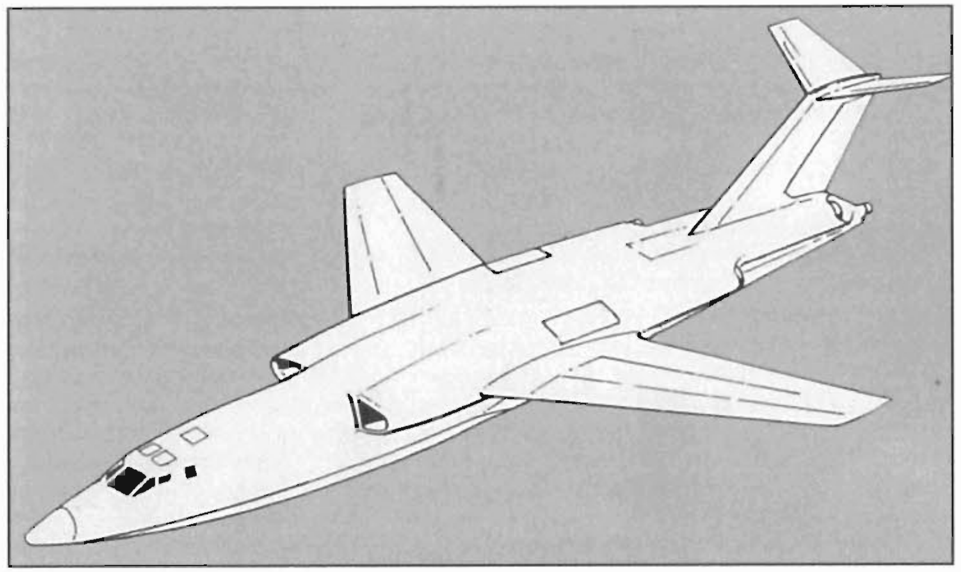


At top, Model 307 "SeaMistress". (Martin) Above, Model 316 "Skipper". (Martin) At right, Model 329-C-1. (Martin) Below right, Model 331 nuclear powered bomber. (Martin)



MODEL 329: The Model 329 was a supersonic patrol seaplane concept which incorporated area-rule technology to allow Mach 1 and above performance. Two designs were studied under a Navy preliminary contract (NOas 56-476c). 329-A was for a Mach 1 aircraft and 329-B was for a Mach 2 airplane. These designs led to a 329-C-1 and a 329-C-2 version.

MODEL 331: The Nuclear Patrol/Attack Seaplane concept was studied starting with the basic P6M design and developing into the highly advanced-looking Model 331-10 version which was to be capable of Mach 1.5 with GE's AC-110 reactor driving two Pratt & Whitney J75 engines.



SF
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VP 48

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NAVY
VP 50
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NAVY
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NAVY
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QE
5533
NAVY
VP 40

SF
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NAVY
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SG
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VP 50
7

1284

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3A
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NAVY

U S COAST GUARD

RP
7931
16
NAVY